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AND

POPULAR DESCRIPTIONS

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HEMEROCALLIS FORRESTII

(Plate 481)

HEMEROCALLIS FORRESTII

Forrest's Daylily

Native in Yunnan, China

Family LILIACEAE — LILY Family

Hemerocallis Forrestii Diels, Notes Bot. Gard. Edinburgh 5: 208. 1912.

The species *Hemerocallis Forrestii* is based on wild plants observed and collected by Forrest in Yunnan, China, where he found them growing on "dry cliffs and ledges of cliffs in side valleys on the eastern flank of the Lichiang Range." Since then two other and somewhat similar species from the same general region have been named (*H. nana* and *H. plicata*). Evidently there is a group of dwarf or semi-dwarf types or species of *Hemerocallis* growing in the mountains of the Province of Yunnan.

Either living plants or seeds, or both, of *H. Forrestii* were sent to England from which the species is being propagated and distributed for culture. Living plants with this specific name have been obtained at The New York Botanical Garden from The Royal Botanical Gardens at Kew, England, and from the garden of the Royal Horticultural Society at Wisley, England. Several of these plants have bloomed. They all appear to be very uniform in character.

In the original notes by Forrest on the wild plants of this species, the color of the flowers is given as a deep reddish orange and in the first description published it was considered that the species is related to the *H. fulva* of Linnaeus. There has, however, been no trace of the epidermal fulvous pigments characteristic of *H. fulva* and *H. aurantiaca* in any of the flowers thus far obtained from plants of this species at The New York Botanical Garden. The species seems to be very distinct from any of the fulvous daylilies now known. The species appears to be dwarf or semi-dwarf in growth, but there is one reference (The Garden **84:** 157. 1921) which states that plants of *H. Forrestii* grew vigorously until the stems reached a height of three and one half feet. It is probable that there was an error in the identity of the plants obtained.

Plants of Forrest's Daylily have foliage about eighteen inches long and one half inch in width; the color is a medium green; the habit of growth is ascending recurving. The scapes are slender, ascending but not stiffly erect, and in all plants thus far observed in bloom the scapes are shorter than the leaves. The scapes are

sometimes unbranched, but are frequently branched, producing, according to descriptions published, as many as eight to ten flowers. Possibly old well-established plants will be more robust. The flowers are on short pedicels; they have a short perianth tube with scarcely any shoulder at the juncture with the perianth, and hence the perianth tapers into the tube. The petals are narrow, not more than an inch in width, and the sepals are more narrow. The flower color is a uniform cadmium yellow, gold-glistening over the inner surface, and with no trace of fulvous pigments. Only two capsules have been seen on plants of this species by the writer and both were from cross-pollination. The larger one is shown in figure 3 of the accompanying plate. It contained but seven seeds, so its shape may not represent adequately the capsules typical for the species.

A. B. STOUT

EXPLANATION OF PLATE. Fig. 1.—Face view of fully opened flower. Fig. 2.—Portion of leaf. Fig. 3.—Capsule.

HEMEROCALLIS CITRINA

(Plate 482)

HEMEROCALLIS CITRINA

Citron Daylily

Native in Northern Shen-si, China

Family LILIACEAE — LILY Family

Hemerocallis citrina Baroni, Nuo. Gio. Bot. Ital. 4: 305. plate 9. 1897

Either living plants or the seeds of the *Hemerocallis citrina* were collected in northern Shen-si, China, by Padre Giraldi and sent to Florence, Italy, where plants of this stock were grown in the Botanical Garden. In 1897, Baroni described these plants as a new species, and shortly thereafter C. Sprenger of Naples obtained some of them for propagation and for distribution. Later Sprenger obtained seeds or living plants of this same species directly from Hupe, China, but these were somewhat less vigorous in growth (See Gard. Chr. 3rd Ser. **36:** 51. 1904) than those obtained from Shen-si. It appears that vegetative division and seed reproduction were both employed in multiplying the stock. The species was also used in hybridization and some of the hybrids strongly resemble the *H. citrina* parent. Several somewhat different plants have been propagated as clons and distributed under the specific name of *H. citrina*. The plant here illustrated and described is one obtained from Mr. Willy Müller, who is now continuing the nursery business in Naples established by his uncle, C. Sprenger. It is believed that they are of the vegetative propagation from the plants first introduced.

The night-blooming habit which is strongly developed in this species is also to be seen in other types of daylilies. The flowers of wild plants of *H. Thunbergii* often open in the evening and close early in the following forenoon. The Japanese book "Somoku-Dzusetsu" describes, (its plate 18) under the name *Hemerocallis Dumortierii* in the second edition but under the name *H. minor* in the third edition, a daylily whose flowers open after sunset and close and wilt in the next forenoon. The Japanese names for this plant are "Yuusuge" meaning Evening Daylily, and "Matsu-yoi-gusa" meaning Waiting Evening-herb. For this and other translations of the "Somoku" the writer is indebted to Professor Tokujoro Maekawa of the Hokkaido Imperial University, Sapporo, Japan.

Plants of the citron daylily are of compact growth, extending their area in the crown by short lateral branches and not by widely spreading rhizomes. The foliage is coarse, as much as one and one half inches in width; the leaves are as much as forty-five inches

long, decidedly erect in growth but bending abruptly and often breaking at a general level of about three feet. The foliage is dark green, but dies quickly in late autumn becoming yellowish brown while many other daylilies are still freshly green. The color of the bases of the outside leaves is of a pink tinge especially in spring. The scapes are stiffly erect and almost vertical, as much as forty-five inches tall; strong, but brittle when abruptly bent; and much branched near the apex, bearing as many as sixty-five flowers to a single scape. The flower color is pale lemon yellow but the sepals are greenish on the back and purplish at the apex, a feature especially noticeable in the flower bud. The perianth tube is as much as one and one-half inches long, and somewhat thick rather than slender. The petals are usually about four inches long and only three-fourths of an inch in greatest width. The flowers begin to open in the evening, are widely open during the night, and usually close promptly with the coming of daylight, especially on warm sunny days. The flowers are strongly odorous of a pleasing quality. The period of blooming is late mid-summer. The capsules are usually about one inch in length, obovate, deeply and sharply grooved, indented and purplish at the apex.

A. B. STOUT

EXPLANATION OF PLATE. Fig. 1.—Flower open as at night. Fig. 2.—Flower closed and wilting in the condition most frequently seen during the forenoon. Fig. 3.—Tip of a leaf. Fig. 4.—Capsule fully developed, but drawn while still green to show shape. Fig. 5.—A seed.

HEMEROCALLIS FULVA LONGITUBA

(Plate 483)

HEMEROCALLIS FULVA LONGITUBA

Long-tubed Fulvous Daylily

Native of China and Japan

Family LILIACEAE — LILY Family

Hemerocallis disticha Donn. Hort. Cant. 1804.—Sweet, British Flower Grower 1: plate 28. 1823
Hemerocallis longituba Miquel, Ann. Mus. Bot. Lund. Bot. 3: 152. 1868
Hemerocallis fulva var. *longituba* Maxim., Gartenflora 34: 98, excluding plate 1187. 1885

About the year 1798 a daylily found its way from the Orient into England and in 1804 it was listed under the name *Hemerocallis disticha* in a catalog of the plants then being grown in the Cambridge Botanical Garden. Evidently the type was kept in cultivation, and in 1823 a very good description and a colored plate of it were published. It is clearly evident that this plant was a fulvous daylily whose flowers had narrow segments and long perianth tubes, and that it was distinct from the old *H. fulva* of Linnaeus which had already been long in cultivation as a garden plant in Europe. Later, as cited above, the name *H. longituba* was given to this type, and still later the Russian botanist Maximowicz ranked this type merely as a variety of the *H. fulva* of Linneaus. But Maximowicz evidently also included with this type the plant that has since been called *H. aurantiaca*, for his plate is certainly of that species.

A Japanese book (Somoku Dzusetsu) dealing with indigenous and cultivated plants of Japan gives uncolored plates of several daylilies. One of these, (plate 16) is named *H. graminea* in the second edition, published in 1874, but in the third edition, of 1907, the name given to this plate is *Hemerocallis fulva* L. var. *longituba* Maxim. The common Japanese name for this plant is "Beni-kwanzo" meaning Red Kwanzo or Red Daylily, and the flower color is described as yellowish or brownish dark red. The third edition states that this form is a variety of *H. fulva* which is distributed everywhere on the main island of Japan. The varietal name *H. fulva longituba* is also mentioned in other publications dealing with the wild daylilies of Japan.

The New York Botanical Garden has received living plants of wild fulvous daylilies from Kuling and from Purple Mountain, China, through the kindness of Dr. A. N. Steward of the University of Nanking, and from various localities on the island of Hokkaido, Japan, through the assistance of Professor Y. Hoshino and of Mr. T. Susa, Instructor of Horticulture, of the Hokkaido Imperial University. While all these plants are fulvous daylilies which have

spreading rhizomes, capsules of the same general shape and character, and scapes that stand high above the level of the leaves, there is much variation among them in other respects. The plants from Purple Mountain have much the coarser foliage; those from Japan have more brownish-red coloring in flowers; those from Kuling have more slender leaves of darker green and somewhat taller scapes. But some of the plants from each location have flowers with narrow segments and rather long perianth tubes. Possibly a careful study of the various types and a survey of their natural distribution in the wild would show two or more species but at present it seems best to include them all in the one species *H. fulva* L., recognizing some of the rather marked wild types as natural varieties.

The particular plant here illustrated is one from Kuling, in Kiangsi Province, China, the exact locality being about fifteen miles from the city Kinkiang on the Kangtze River. Dr. Steward states that these plants "were growing in tussocks along the bank of a small stream in the bottom of the bushy ravine above that part of the Kuling Estate known as Methodist Valley, at an elevation of about 3500 feet," and adds that "the plants were sufficiently plentiful in the vicinity so that our cook gathered the flower buds from time to time for use as a vegetable in our food".

The most distinctive character of *Hemerocallis fulva longituba* is the relatively long and somewhat slender perianth tube, and to this may perhaps be added the narrow segments of the flower. As a rule the perianth tubes are at least one and one-quarter inches in length, and the flower segments are from three and one-half to five inches in length and seldom more than three-fourths of an inch in greatest width. Thus in the open flower the segments are not overlapping except at their extreme bases and the flowers lack fullness, and also the segments are somewhat laxly recurving. In the particular plant here used to illustrate the variety, the color in the throat of the flower is orange-yellow with a stripe extending lengthwise through the segments: outside of this there is an overcast of fulvous red which is more intense at the base. But the exact coloring of flowers, character of the foliage, and habit of growth is rather variable for the group of plants having the noticeably long perianth tubes. The capsules of all the wild varieties and of the cultivated clons of the species *H. fulva* are very similar in shape and size, being rather broadly obovate, with the apex truncate and indented. The median line of each valve is deeply grooved and the groove between the valve is sharp and narrow. The capsule shown in Plate 483 was not fully ripe and is hence not of full size: the one shown in Plate 484 was fully ripe and plump and it contained seeds. That the type of flower with long perianth tubes is widely distributed among the wild daylilies of the Orient is evident.

A. B. STOUT

EXPLANATION OF PLATE. Fig. 1.—Flower with summit of scape. Fig. 2.—Apical portion of a leaf. Fig. 3.—Capsule still somewhat immature but showing typical shape.

HEMEROCALLIS FULVA ROSEA

(Plate 484)

HEMEROCALLIS FULVA ROSEA

Rose-flowered Daylily

Type locality, Kuling, China

Family LILIACEAE — LILY Family

Hemerocallis fulva L. var. *rosea* Stout, var. nov.

The wild fulvous daylilies of the Orient, at present to be included in the one species *Hemerocallis fulva* of Linnaeus, are widely distributed in China and Japan, and they evidently comprise several natural varieties or strains. In respect to the colors of the flowers, a type with rose, or pink, or bright shades of red colorings may now be recognized. Living plants with such flower colors were collected at Kuling in the Province of Kiangsi, China, by Dr. Albert N. Steward and sent to The New York Botanical Garden where they are now being grown. Seedlings from these plants have also been reared to blooming age. There is some variation in the precise shade of color and in the intensity of the eye zone, but the general aspect of color is decidedly a pink or a rosy red in contrast to the duller and brownish fulvous colors more commonly known for the species. The rosy effect may however be due chiefly to a difference in the pigments of the interior of the flower rather than to the red pigments of the epidermal layers; for the *rosea* type the throat is yellow rather than orange, a condition well shown in comparing plates 483 and 484. Among plants having *rosea* flowers there is considerable variation in the shape of the flower segments and in the length of the perianth tube. Thus far all the wild plants with rose colorings that have been received at The New York Botanical Garden have come from a locality in Kuling, China, where plants of the *longituba* variety and with the duller orange-fulvous colors were also growing under conditions which favor natural cross-pollination between the two types. It seems desirable to recognize the pink colorings as a color variation worthy of botanical designation. It is also possible that the type may be valuable in breeding for the development of new races of pink- and red-flowered daylilies for garden use.

The plant here illustrated came from the wild in Kuling, China, in the location described in the discussion of plate 483. It is being propagated by division. If better plants for garden culture are not developed by breeding, the clon derived from this plant could in

time be planted very extensively. In this case the plants of this group will not constitute the variety *rosea;* they will simply be a horticultural clon propagated from one plant of the variety, the individual characters of which would best be recognized by a special horticultural name.

In the characters of the foliage, the scapes, and the capsules, plants with the rose shades of color in flowers are similar to the plants of the wild plants of *H. fulva longituba* described with the preceding plate. The variety appears to be a color variation only. The pigments in the inner tissues are pale yellow rather than orange which contributes to the effect produced by the red pigments in the epidermis. Flowers with large or broad petals have more surface and hence a greater display of color. Of the wild plants thus far obtained of the *rosea* strain, the particular plant illustrated is one of the best plants for use in breeding and for propagation.

A. B. STOUT

EXPLANATION OF PLATE. Fig. 1.—Flower with apical portion of scape. Fig. 2.—Tip of leaf. Fig. 3.—Fully mature capsule. Fig. 4.—Seeds.

HEMEROCALLIS CLON LUTEOLA

(Plate 485)

HEMEROCALLIS CLON LUTEOLA

Luteola Daylily

Horticultural Hybrid

Family LILIACEAE — LILY Family

That the Daylily Luteola is a hybrid of horticultural origin is certain, but there is some discrepancy in the published statements regarding its parentage. What appears to be the first reference to "*Hemerocallis Luteola*" (The Garden **57:** 407. 1900) calls it a hybrid between "*H. aurantiaca major*" and *H. Thunbergii* but does not report the place of origin. In 1903 this same journal credits Messrs. R. Wallace and Co., of England, with having made the hybridization, but states that the same cross was also made by a continental firm. In the summer of 1905 an Award of Merit was voted by the Royal Horticultural Society of London to a daylily exhibited by Messrs. R. Wallace and Co. under the name *Hemerocallis x luteola*" and the parentage is recorded as being *H. aurantiaca* x *H. Thunbergii*. A plant of "*H. luteola*" is also credited to the hybridizer Sedon (Gard. Chr. 3rd Ser. **36:** 465) as a seedling of the cross between *H. Thunbergii* and *H. aurantiaca major*. The custom of giving a single name of specific and botanical rank, as was evidently done in this case to various seedlings of hybrid origin which differ somewhat from each other, and which are later propagated as horticultural clons is rather confusing to gardeners. It will be better to give to each clon a purely horticuitural name, as was done for the Daylilies Florham and Parthenope, which are also said to be hybrids between "*H. aurantiaca major*" and *H. Thunbergii*. The latinized specific name "*luteola*" as used in the early description may now be used as a horticultural name for the clon produced by Messrs. R. Wallace and Co.

Several somewhat different clons have been received at The New York Botanical Garden under the name Luteola, the differences being in the size of the plants and in the shade of yellow of flowers and in their fullness. The particular clon here illustrated and described has been grown in The New York Botanical Garden for a period of more than twenty years and it is presumed that it is from the hybrid introduced by Messrs. R. Wallace and Co.

A plant of the Luteola Daylily is of compact growth. The leaves are ascending recurving, and as long as thirty-six inches, but in bending they reach a general level of about twenty-eight inches;

they retain good green colors until late in autumn. The scapes are ascending, as much as thirty-six inches tall, and branching or forked at the apex. The flowers are full, with segments well expanded and somewhat recurved; the width being as much as five inches. The color is uniform and of a shade slightly darker than lemon chrome. The perianth tube is rather stout and greenish in color. The period of bloom at New York covers at least a month beginning about the middle of June. The clon sets no seed to its own pollen, but is highly fruitful to pollen of *H. Thunbergii* or *H. aurantiaca*. The capsules obtained to such cross-pollination are usually about one and one-half inches in length, broadly truncate and indented at the apex, and rather shallow-grooved.

A. B. STOUT

EXPLANATION OF PLATE. Fig. 1.—Flower with upper portion of scape. Fig. 2.—Tip of leaf. Fig. 3.—Capsule. Fig. 4.—A seed.

PLATE 486

ADDISONIA

HEMEROCALLIS CLON GOLD DUST

(Plate 486)

HEMEROCALLIS CLON GOLD DUST

Gold Dust Daylily

Of Horticultural Origin

Family LILIACEAE — LILY Family

There appears to be no record in horticultural literature regarding the origin and the parentage of the Daylily Gold Dust. Mr. George Yeld in England, who was one of the first, if not the first, deliberately to hybridize daylilies, states in 1906 (Report Third International Conference on Genetics, page 415. 1906) that the Daylilies Gold Dust, Sovereign, and Orangeman were then already in the trade, and he states that these are "very similar to, if not identical with" his own hybrids between the species *Hemerocallis flava* and *H. Dumortierii* which he had named Flame, Estmere, William Dean, and Beauty. When we consider that plants of *H. Dumortierii* came into culture in Europe as early as 1832 and that the *H. flava* was then widely grown in gardens, it seems strange that hybrids between these two species did not arise frequently from incidental cross-pollination by insects. Plants of *H. Dumortierii* are only very feebly self-compatible, and seeds from them in garden culture are almost certain to be of hybrid origin. All the clons mentioned above are rather low-growing and early to bloom. They all show various of the characteristics of *H. Dumortierii*, and especially that of red flower buds (See Addisonia **14:** plate 462); but they are better garden plants than this parent species in being more prolific of flowers that are slightly larger, fuller, and usually more open; and the plants are usually more robust. That the other parent of nearly all of these hybrids was some form of *H. flava* is quite probable. The hybrids of this group differ somewhat in precise shade of coloring and in habit of growth. The flowers of Sovereign are paler than those of Gold Dust, while those of Orangeman are still darker and more orange with traces of fulvous coloring characteristic of the fulvous daylilies. Of this particular group of hybrid clons, Gold Dust is one of the best for garden use. The plant here illustrated came to The New York Botanical Garden as a gift from the late Mr. Bertrand M. Farr. Plants received under this name from various nurseries have all been alike and it seems that the general stock in the trade is of one clon and true to one type.

The Gold Dust Daylily has a compact habit of growth spreading in the crown by short lateral branches and not by widely spreading rhizomes. The foliage is rather light green. In late summer or early autumn new leaves cease to appear and the old leaves become dull and brownish from the dying tips. The leaves are rather erect to a height of eighteen to twenty inches. The scapes are stiffly erect to a height of about twenty-six inches, with short branches above, and bearing as many as ten flowers to a single scape. The flower buds are dark or dull red which continues for the opened flower on the back of the sepals. The color of the inside of the flower is a clear uniform shade of yellow very nearly the light cadmium of the Ridgway Color Standards. The expanded perianth has a spread of about three inches; the petals are about one inch in greatest width; the sepals are more narrow. The flower is fairly full and spreading. At The New York Botanical Garden, Gold Dust begins blooming very early in May; the climax of bloom comes late in May; and the last of its flowers open about the middle of June. The individual flowers often last more than a day, hence there may be two sets of flowers open at the same time, the older being somewhat darker in color. This behavior is, however, not confined to this daylily. The entire clon Gold Dust is fully incompatible in fertilization and there is cross-incompatibility with many other types, and hence capsules do not usually form. But certain pollinations give fertilization and then capsules may readily be had. This condition is very frequent among daylilies. The capsules are short, less than one inch in length, rather oval in longitudinal outline, broadly grooved along the median line of the valves, giving a rather small capsule decidedly different from those of either of the supposed parents.

A. B. STOUT

EXPLANATION OF PLATE. Fig. 1.—Flower and portion of scape. Fig. 2.—Portion of a leaf. Fig. 3.—Capsule.

HEMEROCALLIS CLON MIKADO

(Plate 487)

HEMEROCALLIS CLON MIKADO

Mikado Daylily

Horticultural Hybrid

Family LILIACEAE — LILY Family

The Mikado Daylily is a seedling recently obtained at The New York Botanical Garden in an effort of selective breeding for the development of fulvous daylilies of special merit as garden plants. It is a complex hybrid having in its parentage the two fulvous daylilies *H. aurantiaca* and the *H. fulva* clon Europa, the species *H. flava* and either *H. aurantiaca* or "*H. aurantiaca major*". As may be expected from such a complex ancestry the seedlings thus obtained show much diversity, and the colors of their flowers range from pale lemon yellow through many shades of yellow, of orange, and of fulvous red, both in single color effects and in various combinations of eyed patterns. In the flower of the seedling which was named Mikado the zone of color is more intense and in greater contrast than in any other daylily now known. There is also good size, form, and fullness of flower, and an excellent semi-robust habit of growth. All who have seen this daylily in bloom readily agree that it is a plant of unusual charm and of distinctive merit as a plant for flower gardens. The descriptions of new daylilies published in "House and Garden" for January, 1929, contain the first printed reference to this clon.

The foliage of the Mikado Daylily is medium coarse, ascending curving and reaching a general level of about 20 to 24 inches. The flower stems rise about ten inches higher and are ascending rather than erect. The dome of leaves remains freshly green and in tidy attractive appearance until the heavy freezes of autumn arrive. The flowers are about five inches in spread; the segments are fairly broad, somewhat stiffly spreading-recurving, and of good texture. In the middle of each petal there is a large blotch of dark and almost purplish red of the shade called mahogany red, bisected by a strip of the same color as that of the blade, and in the open flower these combine to form an undulating zone of bold coloring which is in sharp contrast to the rich orange of the rest of the flower. The season of bloom is mid-summer, or chiefly during July at The New York Botanical Garden. The clon *Mikado* does not set seed to self-pollination. The capsules, obtained by cross-pollination, are nearly ovate in outline, somewhat grooved, and in general character not closely resembling any one of the species involved in the parentage.

A. B. STOUT

EXPLANATION OF PLATE. Fig. 1.—Flower and portion of scape. Fig. 2.—Capsule almost mature.

HEMEROCALLIS CLON WAU-BUN

(Plate 488)

HEMEROCALLIS CLON WAU-BUN

Wau-Bun Daylily

Horticultural Hybrid

Family LILIACEAE — LILY Family

The Daylily Wau-Bun arose as a hybrid seedling recently reared at The New York Botanical Garden and now being propagated as a clon for culture as a garden plant. The horticultural name Wau-Bun was first employed in print in a popular description of the plant which was published in "House and Garden" (**55:** 126. 1927). It has for its immediate ancestry the two species *Hemerocallis flava* and *H. aurantiaca* and the Luteola Daylily which is in itself a hybrid. For colored illustrations of these parents see Addisonia **14:** plates 457 and 461, and plate 485 of this number. An unusual form of flower due to the folded and twisted character of the petals, large size of flower, rich yellow colorings, and a good habit of growth give this clon much individual charm as a plant for the flower garden. The Winnebago Indian name *Wau-Bun*, which signifies the early morn with its rising sun, has been chosen as a suitable horticultural name for this hybrid clon.

A plant of the Wau-Bun Daylily is, in comparison with the entire group of daylilies, of semi-robust stature. The foliage is bending and arching and stands at a general level of about thirty inches, and it remains freshly green throughout the autumn. The scapes are ascending to a height several inches above the dome of leaves, and are branching near the top. The flower is of a large size for daylilies; the sepals are broad and smoothly and stiffly recurving; the petals are broad, spreading rather than strongly recurving, and in the outer half they are folded backward along the midrib and also somewhat twisted near the tip. This gives a form of flower that is not seen among the other named clons of daylilies. The color of both sepals and petals is the shade of yellow known as light cadmium over which there is a delicate sprinkling of faint fulvous red. There is also the glistening in sunlight as if the surface were sprinkled with numerous tiny flecks of gold—a quality very generally seen in flowers of daylilies. The period of blooming is mid-summer. The original seedling has been fully self-incompatible, as are many of the daylilies, and the clon can not be expected to produce seeds to self- and to close-pollination or to intraclonal pollinations. Capsules and seeds are freely produced to compatible cross-pollinations. The capsules are about one and one half inches in length, obovate with a rather truncate apex; the longtudinal grooves are somewhat coarse and shallow.

A. B. STOUT

EXPLANATION OF PLATE. Fig. 1.—Flower with apex of scape. Fig. 2.—Tip of a leaf. Fig. 3.—Capsule. Fig. 4.—A seed.

DEERINGOTHAMNUS RUGELII

(Plate 489)

DEERINGOTHAMNUS RUGELII

Yellow Squirrel-Banana

Native of northeastern Florida.

Family ANNONACEAE CUSTARD-APPLE Family

Asimina reticulata Shuttl. in Distr. Pl. Rugel. Not *A. reticulata* Chapm.
Asimina Rugelii B. L. Robinson, in A. Gray Syn. Fl. 465. 1897.
Deeringothamnus Rugelii Small, n. nov.

The circumstances connected with the discovery of the shrub *Deeringothamnus pulchellus* are on record.[1] Those connected with the discovery of the present plant, the only other species of *Deeringothamnus* now known, are not recorded; but we can easily imagine them and make the record after nearly a century has passed, and it is a comparatively simple problem.

Ferdinand Rugel, like several other collectors, went into peninsular Florida about the time of the Indian Wars. Not all of them came out; for example, E. T. Leitner, discoverer of the Leitneria, a tree with a wood lighter than cork, and of the Florida yellow water-lily, fell a victim to the Seminoles, or at least he never returned to civilization. Although Rugel and Leitner apparently covered some of the same ground, Rugel came out alive and later lived many years as a druggist in Tennessee. In 1843 Rugel visited New Smyrna, the sight of the first land scheme of the Peninsular State, started as a settlement for growing indigo and colonized by people from the Mediterranean region in 1765. Indian troubles and local geography were evidently responsible for the early discovery of this plant. The old trails between the various settlements and forts along the coast, were not direct through the low savannas and hammocks, but sought the higher ground for here there was less danger of being bushwacked by the Indians. Evidently going west of the settlement on the trail to the higher grounds in the interior of the peninsula he discovered the plant here illustrated in the pinelands several miles from the coast. The Rugel plants were sent abroad and lay for many years not properly named and unstudied. Nearly a century after the discovery, the writer set out Christmas Day in 1925 to rediscover the plant. About two miles west of New Smyrna he was rewarded by the discovery of several stems bearing three or four leaves. The following spring further search was made in the same region and acres of this lost species

[1]Addisonia **11:** 33, pl. 369. 1926.

were discovered. The reason for the scarcity of the plants in the winter was now evident. The flowers and fruits of *Deeringothamnus* are borne on stems of the season and these soon die. This is one of the characters that distinguishes this genus from *Asimina*, in which the flowers are borne on old wood.

The yellow squirrel-banana is a low shrubby plant. The root is fusiform and perpendicular, unless downward growth is interfered with, usually six to eighteen inches long, black, finely pubescent near the tips. The stems are more or less clustered; erect or nearly so; the leafy shoots 1-3 dm. tall, red or reddish brown, usually simple, glabrous. The leaves are alternate, bright green, turning yellow in the autumn. The blades are spatulate to elliptic, 3-8 cm. long, obtuse or sometimes abruptly pointed, slightly paler beneath than above, finely reticulate, glabrous above, minutely pubescent on the veins beneath, scarcely petioled. The flowers are borne on the wood of the season, solitary in the axils of leaf-like bracts, short-pedicelled, mostly spreading or nodding. The three or sometimes four sepals are ovate to deltoid, green, a fifth to a quarter of an inch long, acutish or obtuse at the apex, more or less gibbous at the base, faintly three-veined, finely pubescent. The usually six petals are yellow, sometimes fading to cream-color, fleshy, lanceolate to elliptic-lanceolate, or oval, twice or nearly thrice as long as the sepals, obtuse, glabrous, often brown-spotted without, somewhat curved outward, thick edged. The often fifteen or sometimes numerous stamens are crowded on the flat receptacle, surrounded by the petals and surrounding the pistils. The filament is very short, extended into the clavate connective which terminates in a knob-like apical appendage. The anthers are cuneate or elliptic, about one-twelfth of an inch long. The pistils are usually two to six together, erect. The ovary is flask-shaped, minutely pubescent, slightly constricted below the flaring top. The stigma is loosely jointed to the top of the ovary, curved and cushion-like, early deciduous. The fruit is a cluster of two to six berries, or these solitary, drooping. The berries are spreading, subglobose to ellipsoid-cylindric, a half to two inches long, stout stipitate, light-green or variegated with light and dark green, glabrous. The seeds are solitary or several in a berry, slightly flattened, brown,shining, with a yellowish crest-like raphe.

JOHN K. SMALL

EXPLANATION OF PLATE. Fig. 1.—Flowering stem. Fig. 2.—Leafy stem. Fig. 3.—Sepal, x 2. Fig. 4.—Petals, x 2. Fig. 5—Stamens, x 4. Fig. 6.—Pistil, x 4. Fig. 7.—Fruits. Fig. 8—Seeds.

MALVAVISCUS DRUMMONDII

(Plate 490)

MALVAVISCUS DRUMMONDII

May-apple

Native of the Gulf of Mexico Region

Family MALVACEAE — MALLOW Family

Malvaviscus Drummondii T. & G. Fl. N. A. 1: 230. 1838.
Pavonia Drummondii T. & G. Fl. N. A. 1: 682. 1840.

The mallow family is very important as an economic group in all parts of the tropical and temperate zones, furnishing products that may be classed under the heads of necessities and luxuries.

The roots, stems, leaves, flowers, and fruits furnish foods for the savage and the civilized man. Its fibers have been and are of the first importance, and its plants are often important and very showy horticultural subjects.

This genus was proposed many years ago, (1763). The generic designation is one of those names whose composition was not indicated by the author. Two explanations have been offered: one of them suggests that *Malvaviscus* is a combination of two Latin words, the generic name "*Malva*, and *viscum*, birdlime, from the viscid or mucilaginous fruit;" the other and more likely solution of the problem is that it is one of the so called hybrid designations whose first part is the Latin *Malva* and the Greek ἴσκος meaning similar.

Malvaviscus Drummondii is called "Manzanita" (little-apple) by the Mexicans. While it is a native of a semi-arid region, it is not a desert plant. It grows only in low slightly damp grounds, in river bottoms, along the edges of old resacas. It requires rich fertile soil, which is slightly moist underneath. It blooms from early spring to late fall, but produces an abundance of fruit in the fall, after the humming birds have returned from their northern sojourn. It seems that the humming birds are very fond of its nectar and seem to pollinate the flowers better than do other agencies. Its associates are many, but the chief ones are *Eupatorium odoratum*, *Chiococca racemosa*, *Lantana involucrata*, *Lythrum alatum*, *Erythrina arborea*, *Leucaena pulverulenta*. Mixed with the foliage of these other plants the scarlet flowers and red fruits distinguish this plant extremely well. In Texas, it is said, the fruits, both raw and cooked, are eaten under the name of May-apple.

The manzanita is a shrub up to eleven feet tall, with terete branches which are finely and often closely pubescent, sometimes tomentulose. The leaves are alternate, rather numerous. The

blades are suborbicular in outline, varying to ovate or orbicular-reniform, 2-5 inches long, irregularly crenate or serrate-crenate, usually shallowly 3-lobed, dark green and sparingly pubescent at maturity above, paler and more copiously pubescent beneath, densely pubescent on the veins, cordate at the base, from which usually five to seven veins arise. The petioles are slender, shorter than the diameter of the blades, pubescent like the stem. The flowers are ascending or spreading on axillary rather slender peduncles, solitary or few together. The bractlets of the involucel are spatulate or linear-spatulate, about a half inch long, acute or slightly acuminate, finely pubescent, one-veined. The calyx is companulate, exceeding the involucel, finely pubescent. The calyx lobes are lanceolate to ovate, about as long as the tube or shorter, obtuse or acute, three-veined, ciliolate. The corolla is red, usually scarlet. funnelform, three-quarters of an inch to an inch and a half long, The five petals are broadly cuneate to obovate-cuneate, unequilateral, more or less oblique at the apex, with a spear-like lobe near the base on one side, obscurely pubescent without and minutely ciliolate. The staminal column (united filaments) exceeds the corolla, sometimes twice as long, slender, glabrous, spirally twisted. The free parts of the filaments are subulate. The anthers are borne near the top of the column, oval to oval-orbicular, brown or reddish. The ovary is sessile, terminated by the filiform glabrous style. The stigmas are clavate, truncate at the apex, reddish-brown. The fruit is baccate, depressed-globose, one-half to three-quarters of an inch in diameter, bright-red, slightly-lobed, sometimes depressed at the apex, shining. The seeds are about a sixth of an inch long, glabrous.

JOHN K. SMALL

EXPLANATION OF PLATE. Fig. 1.—Tip of a flowering branch. Fig. 2.—A lower leaf. Fig. 3.—A petal. Fig. 4.—A staminal tube surrounding the style. Fig. 5.—Fruit.

BEFARIA RACEMOSA

(Plate 491)

BEFARIA RACEMOSA

Tar-flower

Native of the southeastern United States

Family ERICACEAE — HEATH Family

Befaria racemosa Vent. Pl. Cels. pl. 51. 1802.
Befaria paniculata Michx. Fl. Bor. Am. 1: 280. 1803.

"Oh, look at the azaleas!" This ejaculation is often heard from a plant lover or a naturalist, not a botanist, in passing through the pine woods in Florida. One must confess that the inflorescence of the fly-catcher does somewhat resemble that of an azalea viewed from a distance, but the resemblance is really very superficial upon close examination.

In Florida the plant here illustrated largely fills its place as the wild-honeysuckle or azalea does further north. In southern peninsular Florida it wholly replaces the wild-honeysuckle.

The tar-flower blooms normally in winter and spring; but it may be found in flower at other seasons in regions where forest fires have interfered with its normal flowering season.

The flowers are white or pink, apparently more pink towards the southern part of the range. The large clusters or wands of flowers form a striking contrast with the mostly uniform green of the foliage of the pine woods.

This tar-flower represents an outlying member of a genus characteristic of Mexico, the West Indies, Central America and the Andes of northern South America, in which region about a dozen and a half different kinds are known to grow. In the Andes of Colombia some species occur at an altitude of between 13,000 and 14,000 feet. They are sometimes known as Alpine rose.

According to Zea, who was a pupil of Mutis, the latter named the genus to perpetuate the name of Befar or Bejar, Professor of Botany at Cadiz.

In the present geologic era this tar-flower is confined to the Coastal Plain in Florida and southern Georgia, and is usually at altitudes of less than a hundred feet. What was its former geographic distribution and where it originated is not known. It is said long ago to have grown on Cumberland Island, Georgia, and to have been cultivated as far north as Charleston, but without much success. However, we predict that some day it will become an important ornamental far above its present natural range. Its

indifferent success in Charleston resulted, probably, from its being grown in the wrong kind of soil. This fly-catcher is exceedingly showy in situ and as a cut flower. Flowering branches placed in water in a room will remain fresh for a week, new sets of flowers opening day after day.

The tar-flower or fly-catcher is a shrub usually two to seven feet tall with hard wood and a thin grayish bark that cracks and shreds on the older parts. The stem is simple or usually with few erect, strongly ascending branches, the older parts becoming glabrous, the younger with more or less scattered, somewhat crisped spreading hairs. The leaves are alternate, mostly ascending, persistent. The blades are firm-herbaceous or somewhat coriaceous, obovate, elliptic, oval, or ovate, mostly one to two inches long, obtuse, abruptly pointed or acute at the apex, bright-green above, pale or glaucous beneath, glabrous, entire, often somewhat revolute, sessile or nearly so. The racemes or panicles are erect, two or three inches to a foot long with the rachis angled and ridged, glabrous or with spreading hairs near the base. The pedicels are ascending, a quarter of an inch to a half inch long in anthesis, puberulent, subtended by small bracts. The calyx is turbinate in anthesis, saucer-like in fruit, glabrous or nearly so. The seven calyx-lobes are orbicular-ovate to suborbicular, shorter than the tube, obtuse or rounded at the apex, often thin-margined. The corolla is showy, white or pale pink, glutinous. The seven petals are elongate, spatulate, three quarters of an inch to an inch long, spreading, glabrous or merely ciliolate at the apex, obtuse. The fourteen stamens are shorter than the petals. The filaments are filiform beyond the subulate base, copiously pubescent below the middle. The anthers are versatile, dark-brown, opening by terminal pores. The ovary is depressed, seated in a slightly lobed disk, slightly lobed, glabrous, sunken at the top, dark-brown. The style is stout-filiform, several times longer than the ovary, red, glabrous, more or less curved. The stigma is disk-like, shallowly lobed, very dark, almost black. The capsule is depressed-globose, nearly or quite a quarter of an inch in diameter, shallowly lobed, glabrous, black, dull, erect. The seeds are very numerous, narrow and curved, about one twelfth of an inch long, reddish.

JOHN K. SMALL.

EXPLANATION OF PLATE. Fig. 1.—Tip of a flowering branch. Fig. 2.—Capsule, unopened. Fig. 3.—Capsule opened to discharge the seed.

PHYSALIS ELLIOTTII

(Plate 492)

PHYSALIS ELLIOTII

Orange ground Cherry

Native of the Gulf of Mexico Region

Family SOLANACEAE — POTATO Family

Physalis lanceolata Ell. Bot. S. C. Ga. 1: 278. 1817.
Physalis Elliotii Kunze, Linnaea 20: 33. 1847.

Physalis, the generic name from the Greek φμσαλις, meaning bladder, refers to the calyx which is more or less inflated at maturity and encloses the berry. The various species of the genus were naturally widely distributed in prehistoric times as the records of early historic times would indicate. References to these plants may be found in the writings of such early students as Dioscorides and Pliny. The fruits seem to have been used in the medicinal practices of the ancients. In later times, as commerce grew to all parts of the globe various species followed the merchants and became established in distant countries and thus the natural ranges were much increased. One reason for the early dispersal of the plants of this group was the fact that they were esculents. The berry borne within the inflated calyx is edible. According to location the plants received such English names as cape-gooseberry, cherry-tomato, winter-cherry, Jerusalem-cherry, ground-cherry. Not only have the berries been eaten, but in some places the foliage is also used as a vegetable.

At present about seventy-five species are known. Some are widely distributed, others are quite local. Some have never been cultivated, others have been grown in gardens, either for interest or for food, for many years. For either of these objects the career of the several species has progressed in waves, so to speak. At times they are quite popular, then for a period they are scarcely noticed. This fruit is not likely to become universally popular, for although sweet, it is prevailed by the somewhat objectionable flavor possessed by many of the nightshades. In their past existence, for some obscure reason the plants have been naturally divided into two groups, those that are annual or of a year's—seasons—duration, having only fibrous roots and those that are perennial or of several or many year's duration through the highly specialized underground parts such as rootstocks or tubers.

The one under special consideration is one of the more interesting and attractive species. It develops a remarkable underground stem system. An investigation of the source of the flowering stems

or branches will disclose tuberous rootstocks often six to eight inches long and an inch or two thick. These contain a large amount of nourishment, sufficient to furnish several generations of flowering and fruiting branches before they are exhausted. The plant is a sand-lover, and the orange colored fruiting calyces are extremely showy on the white sand in some of the coastal parts of Florida.

The orange ground-cherry is a perennial herb with elongate, usually jointed, fleshy rootstocks. The stems are erect or ultimately elongate and decumbent, up to two feet tall, somewhat fleshy, simple or sparingly branched, angled, varying from glabrous or closely fine-pubescent, often somewhat zigzag, green or purple especially on the lower part. The leaves are opposite or alternate, much smaller on the lower part of the stem than above, rather fleshy, usually erect or nearly so. The leaf-blades are glabrous or finely pubescent like the stem, those of the lower leaves spatulate those of the upper leaves oblanceolate, elliptic, linear-elliptic, or lanceolate, two to six inches long, all of them obtuse or acute, entire, but often undulate, more veiny beneath than above, narrowed into short petiole-like bases. The flowers are axillary to the leaves, usually only one flower at a node, rather slender-pedicelled, nodding. The calyx is campanulate, about one-half inch long, the tube bright-green, ribbed at the base, the ribs fading out in the lobes and above the sinuses. The calyx-lobes are deltoid-lanceolate, somewhat shorter than the tube, slightly acuminate, densely ciliate and also pubescent within with branched hairs. The corolla is rotate, with limb mostly one inch to one inch and a quarter wide, sulphur-yellow, often pale, glabrous without, five-lobed and notched between the lobes. The lobes are broadly reniform, each with a minute tip. The throat and tube are woolly, with a brown-purple line below each lobe, but furnishing scarcely enough color to make an "eye". The five stamens are erect, included. The filaments are clavate, adnate below to the corolla tube, purple. The anthers are pale sulphur-yellow, ovoid, those of the longer stamens shorter than the filaments, those of the shorter stamens longer than the filaments. The gynoecium is erect. The ovary is ovoid, about a twelfth of an inch long, yellow, seated in a shallow annular disk, glabrous, slightly lobed at the apex. The style is clavate, usually somewhat longer than the ovary, purple below, yellowish near the tip. The stigma is truncate and obscurely two-lobed. The fruit is drooping from the usually finely pubescent pedicels. The bladdery calyx is ovoid or globose-ovoid, an inch to an inch and a half long, concave at the base, abruptly pointed at the apex, ribbed, reticulate veiny, orange-brown to orange-red, often minutely pubescent. The berry is subglobose, a half to three-quarters of an inch in diameter, shining, greenish-brown to orange. The seeds are flattened, about one twelfth of an inch in diamerer, minutely roughened and dull.

JOHN K. SMALL

EXPLANATION OF PLATE. Fig. 1.—Section of stem with a flower. Fig. 2.—Part of a corolla laid open showing the stamens. Fig. 3.—Pistil seated in disk which is subtended by two lobes of the calyx. Fig. 4.—Three fruits near the end of a stem. Fig. 5.—Half of bladdery calyx removed to show the berry.

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M.E. Eaton

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CONSOLEA CORALLICOLA

(Plate 493)

CONSOLEA CORALLICOLA

Florida Semaphore Cactus

Keys of the Florida Reef

Family CACTACEAE — CACTUS Family

Consolea corallicola Small, sp. nov.

The West Indian character of the vegetation of the Florida Keys is in evidence everywhere in the hammocks. None of the elements, however, is more striking than a semaphore cactus, for aside from the one here illustrated, this group of the cacti is not known outside of the West Indian region as ordinarily interpreted. The present species was not discovered until the spring of 1919 when it was found on Big Pine Key. Later it was found in the hammocks of Key Largo. It has since been in cultivation in the cactus plantations of Mr. Charles Deering at Buena Vista and at Cutler, Florida, the reservation of Mrs. Arthur Curtiss James at Coconut Grove, Florida, and in the conservatories of The New York Botanical Garden.

"Semaphore" in this connection refers to the unusual placing of the branches on the main stem. In fact, irregularities obtain throughout the plant. The main stem is roundish but more or less flattened in one plane. The much flattened branches are placed more or less spreading on the stem in the plane of its greatest diameter—hence the suggestion of a railroad semaphore—the branches, flowers, and fruits are inequilateral. In its native haunts plants may flower throughout the year. Aside from the unusual vegetative habit and aspect of the plant, the flower is both interesting and instructive. The "flower" of a cactus is made up of two gross parts, the flower-axis and the flower proper. The flower proper consists of the essential organs—stamens and pistil—and the perianth—calyx and corolla. The flower-axis or hypanthium is the more interesting organ in this case as it clearly shows that this structure, formally usually termed the calyx-tube, is not a part of the flower. It is an inverted receptacle. In the cacti it houses the ovary in its cavity and the two organs are now more or less grown fast to each other. If pollination has taken plaee, the ovary and its contents develop into the fruit together with this hypanthium which makes a fleshy coat to the ovary proper. Should pollination fail either the "flower" withers and falls off with the chance of vegetatively making a new plant, or the "flower" sheds its perianth and essential organs and develops back into a branch later indistinguishable from the strictly vegetative branches.

The subject of this note is a forest cactus. It is to be expected on any of the Florida Keys where there are primeval hammocks. Like its associates, the tree-cacti (*Cephalocereus*) this semaphore grows on almost bare rock. Soil is scarcely necessary; a little humus about the roots seems to be sufficient to furnish it with food.

The Florida semaphore cactus is tree-like, six feet tall or more, light-green. The main stem (trunk) is erect, arising from coarse fibrous roots, ultimately continuous, strict, copiously and bristly armed, elliptic or oval in cross-section. The areolae are numerous, each with a cluster of 5-9 spines. The spines are salmon-colored when young, light-gray when mature and dry, darker when wet, acicular, one of each areola much longer than the others, often four to seven inches long. The joints (branches) arising from the top or near the top of the stem or trunk are elliptic or broader above the middle or below it, inequilateral, more or less curved, relatively thin, the larger ones five to twelve inches long, all copiouly armed, with the spines similar to those of the trunk, but smaller. The leaves usually are very small deciduous scales. The flowers are rather numerous, relatively small, commonly several on a joint. The hypanthium is somewhat elongate, more or less flattened, usually whth spiny, often numerous areolae. The sepals are green, broad, the outer ones deltoid, very thick, the inner more or less reniform, thinner, abruptly pointed. The corolla is one-half to three quarters of an inch wide. The petals are bright-red, obovate to orbicular-obovate. The style has an obovoid base. The berry is fleshy, obovoid or clavate-obovoid, one to two inches long, yellow, with spreading spines, the umbilicus deeply concave. The seeds are few, irregular, about a third of an inch in diameter, flattened, with cristate edges and hairy sides.

JOHN K. SMALL

EXPLANATION OF PLATE. Fig. 1.—Joint from a branch arising from the trunk, bearing three flowers, two in bud, one with the perianth expanded. Fig. 2.—Proliferous fruit. Fig. 3.—Fruit. Fig. 4.—Seed.

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Mary E. Eaton

SWIETENIA MAHAGONI

(Plate 494)

SWIETENIA MAHAGONI

Mahogany

Native of Tropical America

Family MELIACEAE — MAHOGANY Family

Swietenia Mahagoni Jacq. Enum. 20. 1760.
Cedrus Mahogani Mill. Gard. Dict. Ed. 8. *Cedrus* No. 2. 1768.

Mahogany is one of the numerous contributions of the New World to the Old. Like many of the other important necessities and luxuries produced by the vegetable kingdom in America and happened on by the Old World expeditioners in their often nefarious operations among the aborigines, the mahogany represents one of the luxuries of the white man.

In its native regions it is neither a necessity nor a luxury. Among the people where it grows it is just a convenient wood for rough construction and burning. It remained for the carpenter on Sir Walter Raleigh's ship in the West Indies to notice its beauty and durability, about 1595, but it was not until early in the eighteenth century, in England that its value for furniture and cabinet-work was established. Before the end of the eighteenth century vast quantities of the timber were taken to Europe, and before the end of that century the tree was introduced into India where it is still cultivated for its valuable wood.

Contrary to the wide-spread idea that Mahogany is naturally of a dark color, this wood is pale, often whitish. The dark shades as we see them in cabinet work result from applying various stains to the raw wood. The grain of the plain wood is rather fine and even, but when cut into veneer many interesting and conspicuous figures appear. The demand for Mahogany has been so great that a number of woods of a quite different character have been used as substitutes.

The botanical name of this Mahogany has been drawn from both Hemispheres. The generic name commemorates Gerard von Swieten (1770–72), who founded the Botanic Garden at Vienna, while the specific name crystalizes the aboriginal designation of the tree in its West Indian range. In Florida the tree and wood is often known simply as Madeira.

Mahogany is a tropical type of tree in the present floristics of the New World, but like some other tropical types it occurs sparingly north of the Tropic of Cancer, either as an immigrant from the south or as a remnant of a former wider geographic distribution. If it really originated within the tropics and was once confined there it is easy to understand how it once overstepped the conventional

boundary between the torrid and temperate zones, for the seeds adapted to wind dispersal may be carried to great distances during cyclones and hurricanes. North of the Tropic, Mahogany is confined to the hammocks of the Florida Keys and on the mainland to the Everglade Keys and shores of the tip of the peninsula from Cape Sable to Madeira Bay. The Florida growth has been liberally drawn on in the past and but little large timber remains. However, Florida has an exotic supply, brought to its shores through the agencies of the Gulf Stream and the prevailing trade-winds. Beach-combers are always on the lookout for valuable logs from the West Indies that float into the bays and sounds about the southern tip of Florida.

The Mahogany tree is tall and much-branched with a compact wood. The thick bark is reddish-brown, broken into rather broad thick scales. The twigs and branchlets are reddish-brown the first year, but become grayish during the second year. The leaves are numerous, alternate, glabrous, compound. The petiole and rachis are slender, green and often purplish-blotched, wing-margined at the abruptly bent base. The leaflets are mostly 6–10, pinnately disposed, opposite or nearly so, with slender or short petiolules. The blades are ovate to ovate-lanceolate, oblique and very inequilateral and sometimes curved, thin-coriaceous, finely reticulate, narrowly callous-margined, acuminate or merely acute. The panicles are 1–2 dm. long, axillary, shorter than the subtending leaves, with the peduncle and rachis slender, glabrous, bright-green. The pedicels are usually about as long as the flower or longer. The flowers are fragrant, loosely clustered. The calyx is saucer shaped, small and inconspicuous, green, with the lobes reniform, obtuse, pale-green edged, erose. The corolla is greenish-yellow, a quarter of an inch wide or nearly so. The petals are erect or slightly spreading, concave, with the paler edge even or slightly erose and the rounded tip minutely turned in. The stamen-tube is urceolate, shorter than the petals, orange at the inflated base, green above, glabrous, with the 8–10 lobes deltoid to triangular-lanceolate, acute. The anthers are borne on the tube just below the lobes, alternate with them and with their tips reaching about to the sinuses of the lobes. The pistil is mushroom-like, seated in a bright-red or orange, very glandular disk in the bottom of the stamen-tube. The ovary is ovoid, green. The style is columnar, as long as the ovary or slightly longer. The stigma is discoid, shallowly 8–10-lobed. The brown capsule is erect on a stout woody stalk, ovoid, mostly three to three and a half inches long, obtuse, 5-celled, slightly five-lobed, the five woody valves opening from the base upward, up to a quarter of an inch thick, more or less coherent near the top, of two layers, the thinner inner layer with wing-like projections below the middle. The numerous seeds are imbricate, and pendulous from a stout central column, about two inches long, light-brown, with one dorsal keel and two lateral keels near it, and a broad wing, notched and mucronate at the apex.

JOHN K. SMALL

EXPLANATION OF PLATE. Fig. 1.—Inflorescence. Fig. 2.—Stamen-tube laid open. Fig. 3.—Stamen-tube enclosing pistil. Fig. 4.—Pistil seated in disk. Fig. 5.—Capsule and leaf on a branch. Fig. 6, 7—Seeds.

PLATE 495

ADDISONIA

JUSTICIA RUNYONII

(Plate 495)

JUSTICIA RUNYONII

Runyon's willow-herb

Native of the Rio Grande Delta

Family ACANTHACEAE — ACANTHUS Family

Justicia Runyonii Small, sp. nov.

The genus *Justicia*, like various groups of plants with well-known generic names, *Euphorbia*, *Oxalis*, *Polygonum*, and *Oenothera* for example, has always been an attractive botanical "ragbag". Many plants have started under the *Justicia* emblem and later landed in quite different genera. The generic name commemorates the activities of James Justice, a Scotch cultivator and amateur botanist. It was founded on an East Indian plant which was early brought into cultivation. The typical species is a large showy plant, quite different in habit from the one here considered. However, some technical characters possessed by both seem to be sufficient to warrant their being associated under the same generic designation at least for the present. The plant evidently eluded the botanists of the Mexican Boundary Survey who discovered a rather large number of acanthaceous plants in the Rio Grande country. It was not until about 1922 that Robert Runyon, for whom it is named, found it on the banks of the Resaca Viejo, about five miles east of Brownsville, Texas.

Well-drained, usually high, alluvial or otherwise rich soils are best suited to the vigorous growth of this very decorative plant. It will withstand long spells of drought largely on account of its strong root-system, flowering sporadically, but after the fall rains—usually in September—it blooms profusely. The edges of thickets composed of such woody plants as *Trixis angustifolia*, *Momisia pallida*, *Petiveria alliacea*, *Pisonia aculeata*, and *Clematis Drummondii*, is its favorite haunt. Plants have grown well under glass at The New York Botanical Garden. The showy flowers are striking in their native haunts. Horticulturally considered, it is an ideal subject for borders and bedding in the open. The elongated stems and branches become more or less intricately matted. The reddish-purple and striped corollas, falling away each day are replaced by fresh ones.

Runyon's willow-herb is somewhat woody, often with two or more stems from the top of the root. The stems are lax, irregularly spreading or reclining and ultimately prostrate, sometimes rooting

at the nodes, irregularly and sparingly branched, slightly enlarged at the nodes, the internodes bright-green, very minutely pubescent. The leaves are opposite, more or less reflexed. The leaf-blades are lanceolate to linear-lanceolate, or almost linear at the ends of the branches, an inch and a half to five inches long, acuminate, entire, minutely pubescent near the edges and on the veins, dark-green above, pale-green beneath, with the veins rather prominent on both sides, somewhat cuneately narrowed into petiole-like bases. The flowers are clustered in the upper leaf-axils, subtended by narrow ciliate bracts and bractlets, all of which are less than half an inch long. The flower-bud is acuminate, with five wing angles formed by the flaring sides of the sepals. The calyx is about a quarter of an inch long. The sepals are acuminate, green, and finely pubescent on the back, with the white margins ciliate. The corolla is nearly or quite an inch long, mainly reddish-violet. The upper lip is minutely glandular-pubescent without, with revolute margins, narrowed upward to the notched and two-lobed apex, with a sheath-like fold (including the style) running from a hairy orifice near the base of the tube up to the apex. The lower lip has thin broad rounded lobes above the saccate lower part of the tube, the lateral lobes plain reddish-violet, the middle lobe with a deep white-fold, with the white forking out into the purple ground-color. The two stamens are arched up into the upper corolla-lip. The filaments are curved, slightly flattened and slightly enlarged near the middle. The anthers have the sacs unequally attached to the filament-connective. The ovary is conic-cylindric, seated in a cup-like disk, green. The style is filiform, curved, white. The stigma is wide, obscurely two-lobed. The capsule is stout-clavate, about two-thirds of an inch long, puberulent, the stout stipe whitish, the body is green, acute at the tip. The seeds are globose-reniform, black, shining, about a sixth of an inch long.

JOHN K. SMALL

EXPLANATION OF PLATE. Fig. 1.—End of flowering branch. Fig. 2.—Corolla laid open, showing androecium, x 2. Fig. 3.—Calyx laid open, showing gynoecium, x 2. Figs. 4, 5.—Stamens, x 4. Fig. 6.—Capsule.

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Mary E. Eaton

CITHAREXYLUM FRUTICOSUM

(Plate 496)

CITHAREXYLUM FRUTICOSUM

Fiddlewood

Native of Tropical America

Family VERBENACEAE — VERVAIN Family

Citharexylum fruticosum L. Syst. ed. 10, 1115. 1759.
Citharexylum cinereum L. Sp. Pl. ed. 2, 872. 1763.
Citharexylum villosum Jacq. Icon. Rar. 1: 12. 1786.

To one well acquainted with the habit or wood of the subject of this note, in the field, the application of the name fiddlewood seems obscure. There is nothing whatever to suggest anything about a violin. However, by considering the evolution of this name and tracing it backward through several stages the mystery disappears. The botanical generic name for these shrubs and trees is Citharexylum which is the English name fiddlewood turned into Greek. Another step backwards shows us that fiddlewood is a corruption of the French colonial name "bois fidele", a name applied to some of the species of *Citharexylum*, on account of the strength and toughness of the wood. Thus the English "fiddle" disappears in the French "fidele". The wood from the stem of these plants does not enter into the manufacture of any of the members of the violin family.

This fiddlewood is one of the many tropical elements occuring on the mainland side of the Gulf Stream. Coming out of the tropics proper one meets with it on the Florida Keys throughout the chain, both on the oölitic limestone and on the coral-limestone. On the mainland it occurs in the Cape Sable region and on the Everglade Keys. It grows mainly in the hammocks, for the hammocks are its real home, but it is one of the plants that have adapted themselves to pineland conditions after its hammock home has been destroyed, although the plants do not grow as well there. One would expect the northern distribution of the fiddlewood to stop with the Everglade Keys, but it continues northward. The aboriginal redman prepared garden spots, kitchenmiddens and village sites along the coasts, and the migratory birds and roving mammals planted them, carrying the seeds of their food-plants which are mostly berry-bearing shrubs and trees, further and further north. The fiddlewood may be traced up both the Gulf and Atlantic coasts, apparently further north on the eastern coast where it has extended its range nearly or quite up to the Cape Canaveral region. This fiddlewood is a good horticultural subject, but it is often infested with

caterpillars. If this pest can be controlled a glance at the accompanying plate will indicate the beauty to be expected of the fiddlewood with its numerous clusters of ripe fruit, which vary from orange to purple-black, hanging among the bright green shining leaves.

The fiddlewood is a shrub or a small tree up to thirty feet tall, with the stem clothed with brown scaly bark, with the branches mostly erect or ascending and the twigs usually glabrous and pale. The numerous leaves are alternate and evergreen, with the petiole attached to the stem by a socket-like joint. The blades are thin-coriaceous, elliptic to elliptic-spatulate or elliptic-obovate, mostly five to nine inches long, sometimes only four inches long, obtuse or acutish, entire, deep-green and shining above, paler and dull beneath, usually glabrous, rather prominently reticulate beneath, at least when dry, with numerous veinlets connecting the few lateral veins, gradually narrowed to the petiole which is usually from a quarter to three-quarters of an inch long. The spikes are axillary, short-stalked, several to many-flowered, often about as long as the leaves in anthesis, with the rachis finely pubescent. The flowers are very fragrant. The calyx is campanulate, minutely pubescent, green or greenish-white. The tube is 5-angled by thick ribs which extend up into the five minute lobes. The corolla is white. The tube is subcylindric, slightly swollen above the middle, glabrous without, about twice as long as the calyx, pubescent within, especially near the throat. The limb is up to a quarter of an inch wide, with the lobes broad, suborbicular, rounded at the apex, about half as long as the tube, glabrous except the minutely ciliolate margins, spreading. The four stamens are included. The filaments are adnate up to about the middle of the corolla tube, the free parts about as long as the anthers, glabrous. The anthers are ellipsoid, glabrous. The ovary is globular, green, glabrous. The style is columnar, nearly twice as long as the ovary; green. The stigma is capitate and 3-lobed, green. The fruits are in drooping clusters, subglobose to obovoid, about a third of an inch in diameter, shining, orange to purple-black, seated in the calyx, tipped with the style-base, the flesh juicy. The nutlets are in pairs, flat, oval, about a quarter of an inch long, margined.

JOHN K. SMALL

EXPLANATION OF PLATE. Fig. 1.—Inflorescence, with leaf. Fig. 2.—Corolla laid open showing stamens. Fig. 3.—Fruit cluster terminating leafy branch. Figs. 4, 5.—Seeds.

SABINEA FLORIDA

(Plate 497)

SABINEA FLORIDA

Watapama

Native of Porto Rico and the Virgin Islands

Family FABACEAE — PEA Family

Sabinea florida (Vahl) DC., Ann. Sci. Nat. I. 4: 92. 1825.
Robinia florida Vahl; West, Bidr. St. Croix 300. 1793.

Sabinea is a genus of West Indian shrubs or small trees, comprising three known species. One of them, *Sabinea punicea* Urban, endemic in Porto Rico, has already been illustrated in Addisonia (*plate 395*); another, *Sabinea carinalis* Griseb., with large scarlet flowers is native of the island of Dominica.

Sabinea florida, the type species here described and illustrated, grows in dry, often rocky or stony situations at lower and middle elevations in relatively dry parts of the islands it inhabits. As observed by us, it is nowhere gregarious, but occurs as isolated trees or a few growing in proximity. It is not uncommon in Porto Rico and grows also on the smaller islands eastward, including Vieques or Crab Island, Culebra or Snake Island, both Porto Rican, and on the Virgin Islands, St. Thomas and St. Jan, belonging to the United States, and Tortola and Virgin Gorda, British possessions. Flowering profusely in the spring months, it is one of the most elegant of endemic species of its region.

Mrs. Horne's painting was made on March 17, 1927, from a tree near Coamo, Porto Rico.

Sabinea florida is a tree reaching a maximum height of about twenty feet, usually smaller, however, and often shrubby; the branches are wand-like, the young twigs finely hairy. The short-stalked leaves are about four inches long or shorter, with very narrow awl-shaped stipules and from five to fifteen pairs of oblong or elliptic leaflets, which are from one-third to two-thirds of an inch long, blunt at each end, the upper surface smooth, the under slightly hairy. The lavender or pale purple flowers are borne in clusters at the nodes of the branches, some of them in each cluster being expanded at the same time along branches two or three feet in length, forming sprays of great beauty, but they fall away rather soon, and the ground beneath the tree will be seen strewn with the fading blossoms. The flower-stalks are very slender, from one-fourth to one-half inch long. The broadly top-shaped, nearly truncate calyx is about one-fifth of an inch long. The standard is from one-half to three-fourths of an inch broad, the obovate wings one-half to five-sixths of an inch long; the keel is obliquely obovate with a helio-

trope-colored tip, In this species the diadelphous stamens are of two different lengths, five of them about one-half as long as the others. The style is strongly incurved; the stigma small and terminal. The fruit is a slender-stalked, narrowly linear legume from two and one-half to four inches long, flat, and one-sixth to about one-fourth inch wide, containing several seeds, its thin valves separating and twisting when mature.

N. L. BRITTON.

EXPLANATION OF PLATE 497. Fig. 1.—Part of a flowering branch. Fig. 2.—A legume. Fig. 3.—A seed.

CORYNELLA PAUCIFOLIA

(Plate 498)

CORYNELLA PAUCIFOLIA

Retama

Native of Porto Rico and Hispaniola

Family FABACEAE — PEA Family

Corynella paucifolia DC., Ann. Sci. Nat. I. 4: 93. 1825.

The genus *Corynella* (Greek, a little club), established by de Candolle in 1825, with *Corynella polyantha* (*Robinia polyantha* Swartz) of Santo Domingo as the typical species, consists of two, or perhaps three species of pinnate-leaved shrubs, natives of the northern West Indies; they are similar to the *Sabineas* (Addisonia *plates 395, 497*) but with smaller flowers, and the style is stigmatic on the inner side below the tip, the stigma in *Sabinea* being terminal; the legume of *Corynella* is nearly sessile in the calyx, that of *Sabinea* is slender-stipitate. Both of these genera resemble the North American Locust-trees (*Robinia*) in their floral structure, and when species included in them in modern botany were first made known toward the end of the eighteenth century, they were classified generically with them. Locust-trees differ, however, in having flowers in long racemes, and their pods are narrowly winged on one margin.

This species inhabits hillsides in the dry southern districts of Porto Rico, and similar areas of Santo Domingo and Haiti. Its distribution in Porto Rico is apparently quite local, but it has been observed from the vicinity of Coamo, where it is abunbant, westward to San German, sometime forming quite large colonies nearly or quite to the exclusion of other bushes, flowering in the spring.

Our illustration is from a painting made by Mrs. Horne at Coamo Springs, Porto Rico, the flowering branch and the fruit, March 14, the mature leaves, December 4, 1929.

The retama is a shrub from three to about six feet in height, with slender branches and hairy twigs; the short-stalked leaves are from one to about three inches long, with small stipules and from three to six pairs of oblong or obovate smooth and shining leaflets which are about two-thirds of an inch long or shorter, obtuse or acutish, netted-veined on the upper side. The violet colored flowers are borne in small, usually numerous, lateral clusters on the branches, and expand while the leaves are unfolding; their slender, hairy stalks are from one-eighth to one-fourth of an inch long: The nearly bell-shaped calyx is also hairy, with short teeth, the two upper teeth united. The nearly orbicular standard is about one-

third of an inch broad, spreading or a little reflexed ; the wings are oblong, the keel-petals acutish. The style is stigmatic above the middle and below the broad tip. The diadelphous stamens are all about the same length. The ovary is short-stalked and contains several ovules. The fruit is a flat legume, linear, narrowed to the nearly sessile base, about two inches long, and one-fourth of an inch wide.

N. L. BRITTON.

EXPLANATION OF PLATE. Fig. 1.—A flowering branch. Fig. 2.—Mature leaves. Fig. 3.—Legumes.

ADDISONIA

JAQUEMONTIA SUBSALINA

(Plate 499)

JACQUEMONTIA SUBSALINA

Subsaline Jacquemontia

Native of Porto Rico, Cuba and Jamaica

Family CONVOLVULACEAE MORNING-GLORY Family

Jacquemontia subsalina Britton; Britton & Wilson, Sci. Surv. Porto Rico and Virgin Islands 6: 106. 1925.

Jacquemontia is a genus comprising thirty or more species of trailing or climbing vines, most or all of them herbaceous, natives of tropical and subtropical America. It was established by Choisy in 1833, who observed that the flowers of *Convolvulus coeruleus* Schum., the type species, differ from those of the tropical *Convolvulus;* he dedicated the genus to Victor Jacquemont, a French botanical traveller, who died in 1832. The species of *Jacquemontia* have violet, blue or white flowers, mostly clustered in cymes or panicles, but sometimes solitary, or only two together, usually conspicuous, but in some species small. The five sepals are nearly alike, or the outer ones larger than the inner. The Corolla is campanulate or nearly rotate, with a five-angled limb. The stamens are shorter than the corolla, with slender filaments and oblong anthers. The ovary is two-celled, usually containing 4 ovules; the two styles are united, the two stigmas flattened. The fruit is a two-celled, few seeded capsule.

Jacquemontia subsalina inhabits saline or alkaline soil near the coasts of southern Porto Rico, Cuba and Jamaica. It is apparently a halophyte, that is to say a plant which can exist only under saline or alkaline conditions. Our illustration is from plants growing near Boqueron, Porto Rico, painted by Mrs. Horne on February 28 and December 25, 1929.

The subsaline Jacquemontia is a prostrate, slender, fleshy vine, about three feet long or shorter, the stems and branches rooting at the nodes and sparingly hairy. The leaves, borne on stalks about one-half an inch long, or shorter, are oval or nearly orbicular, smooth, from about one-quarter of an inch to about an inch in length, the apex rounded or notched, the base mostly obtuse. The flowers are borne solitary, or two together, on peduncles shorter than the leaves.

The three outer sepals are oval, about one-eighth of an inch long, the two inner ones much narrower. The blue or lavender, subrotate corolla is nearly one-half an inch in diameter. The nearly globular capsule is about one-sixth of an inch in diameter.

N. L. BRITTON.

EXPLANATION OF PLATE. Figs. 1, 2—Flowering branches. Fig. 3—The sepals.

PROUSTIA KRUGIANA

(Plate 500)

PROUSTIA KRUGIANA

Consul Krug's Proustia

Native of Porto Rico

Family CARDUACEAE — THISTLE Family

Proustia Krugiana Urban, Symb. Ant. 1: 471. 1899.

The genus *Proustia*, established by Lagasca in 1811, in honor of a Spanish chemist named Proust, includes some ten species of shrubs and woody vines, natives of tropical America; the one here illustrated is endemic in Porto Rico.

They have alternate leaves and panicled, corymbose, or thyrsoid small heads, of few, perfect and fertile flowers. The involucres of the heads have their bracts imbricated in several series, the outer bracts much shorter than the inner. The pappus consists of numerous, soft, capillary bristles. The stamens have sagittate anthers. The achenes are marked by from five to seven ribs. The corollas are somewhat two-lipped.

Proustia Krugiana inhabits banks and woodlands in relatively dry parts of southern and southwestern Porto Rico, local in its distribution, however, but sometimes abundant over limited areas. When in bloom, in January, its proximity is made manifest by the strongly fragrant flowers. Our illustration is reproduced from a painting by Mrs. Horne of a plant from an extensive colony in the mountains between Aibonito and Coamo.

Krug's Proustia is a vine-like shrub, with long and slender round branches, often ten or twelve feet long, the young twigs finely hairy. The rather stiff and firm pinnately-veined, very short-stalked leaves vary from lanceolate to ovate, from about one inch to three and one-half inches long, the apex pointed, the base rounded or cordate, the margin denticulate or entire, the upper surface rough and strongly netted-veined, the under side finely hairy or becoming smooth. The flower-heads are several or numerous in terminal, panicled corymbs. The involucre is about one-third of an inch long, its bracts hairy, the inner ones linear to linear-lanceolate, the outer oblong or ovate; each involucre contains about seven flowers, borne on a small receptacle. The corollas are bright yellow and the plant thus conspicuous when in bloom. The narrowly linear achenes are about one-fourth of an inch long, the pappus straw-colored.

N. L. BRITTON.

EXPLANATION OF PLATE. Fig. 1.—A flowering end. Fig. 2—A flower.

CESTRUM LAURIFOLIUM

(Plate 501)

CESTRUM LAURIFOLIUM

Galan del Monte

Native of the West Indies

Family SOLANACEAE — POTATO Family

Cestrum laurifolium L'Her., Stirp. Nov. 4: 69. 1788.
Cestrum citrifolium Ritz. in Hoffm., Phyt. Bl. 1: 36. 1803.

Some one hundred and fifty species of tropical shrubs and trees constitute the genus *Cestrum*, established by Linnaeus in 1753, the typical one being *Cestrum nocturnum*, a night-blooming shrub of the West Indies, called Lady-of-the-Night or Dama de Noche. They have alternate, entire, stalked leaves, without stipules, and yellow or white, clustered flowers, the calyx five-toothed or five-lobed, the five-lobed corolla funnelform or salverform, with a slender tube on which the five stamens are borne; in some species the filaments of the stamens are bent and appendaged, and from this feature the generic name *Cestrum* (Greek, a hammer), was given. The ovary is two-celled and contains few ovules; the style filiform, the stigma dilated, in some species two-lobed. The fruit is a small berry, containing few, oblong seeds, with a straight or little curved embryo.

Cestrum laurifolium grows in thickets and woodlands on nearly all islands of the West Indies, except Jamaica, most abundantly in moist or wet regions.

A shrub in the mountains of Porto Rico, between Aibonito and Coamo, provided the accompanying illustration, painted by Mrs. Horne on February 8, 1929, the ripe fruit from one near Cataño, January 20, 1930.

The galan del Monte is a shrub from three to twelve feet in height, smooth throughout, its branches rather stout. Its thick, nearly leathery, shining leaves vary from oblong to elliptic or obovate, from two to seven inches long, the apex acute or blunt, their slender stalks from one-sixth to two-thirds of an inch long. The flowers are borne few together in small axillary clusters, with a bell-shaped calyx about one-eighth of an inch long, its teeth short and broad. The yellow, funnel-form corolla varies from one-half to three-fourths of an inch long, with a spreading limb about one-fourth as long as the tube, its lobes oblong-ovate and blunt. The filaments of the stamens are bent, and denticulate. The ellipsoid or nearly globular berry is one-twelfth to one-half of an inch long and purple-black when ripe.

N. L. BRITTON

EXPLANATION OF PLATE. Fig. 1.—A flowering branch.—Fig. 2—Immature fruits. Fig. 3.—Ripe fruits.

(Plate 502)

ACNISTUS ARBORESCENS

Gallinero

Native of Jamaica, Porto Rico, the Lesser Antilles and continental tropical America

Family SOLANACEAE — POTATO Family

Atropa arborescens L. Cent. Pl. 2: 10. 1756.
Cestrum cauliflorum Jacq., Hort. Schoen. 3: 41. 1798.
Acnistus cauliflorus Schott, Wien. Zeitsch. 4: 1180. 1829.
Acnistus arborescens Schlecht., Linnaea 7: 67. 1832.
? Acnistus frulescens Bello, Anales Soc. Esp. Hist. Nat. 10: 299. 1881.
Cestrum macrostemon Sessé & Moçino, Fl. Mex. ed. 2, 49. 1894.

Acnistus is a genus of tropical American shrubs and trees, about twelve species being recognized by botanists. It was established by the Austrian botanist Schott, in 1829, the species here illustrated being typical. They have broad, entire-margined leaves and rather small flowers, in lateral sessile fascicles, the pedicels slender; the calyx is short and broad, truncate, or with five small teeth; the corolla is narrowly bell-shaped, or nearly funnelform, its short limb usually five-lobed; the usually five stamens are borne on the corolla-tube, with slender or filiform filaments and small, erect anthers; the two-celled ovary contains many ovules, the style is very slender, the stigma slightly two-lobed; the fruit is a nearly globular, many-seeded berry, the roughened seeds with a curved embryo.

Acnistus arborescens inhabits wet or moist regions, and in the West Indies it is mostly restricted to middle or higher altitudes. In continental tropical America its range is from Guatemala to Colombia, Ecuador and Brazil.

Mrs. Horne's painting, here reproduced, was made from a tree near Cayey, Porto Rico, the leaves and flowers February 19, 1928, the berries March 17, 1928.

The gallinero is a shrub, or a small tree, recorded as sometimes reaching a height of about thirty feet, its twigs and leaves either smooth or somewhat hairy. The leaves are thin, elliptic, oblong, or ovate-elliptic, from two to six inches long, with petioles about an inch long or shorter, the apex sharply pointed or blunt, the base narrowed. The flowers appear with or before the new leaves, several together in the clusters, borne on pedicels from about half an inch to somewhat more than an inch in length. The calyx is about one sixth of an inch long, or shorter. The greenish-white corolla one-half inch long, with short, ovate lobes. The stamens project beyond the corolla. The berries are yellow or yellowish and about one-half inch in diameter when mature.

N. L. BRITTON.

EXPLANATION OF PLATE. Fig. 1.—A flowering twig. Fig. 2.—Nearly mature berries. Fig. 3.—Leaves.

ANODA ACERIFOLIA

(Plate 503)

ANODA ACERIFOLIA

Violeta

Native of the West Indies and continental tropical America

Family MALVACEAE — MALLOW Family

Anoda acerifolia (Zucc.) DC., Prodr. 1: 450. 1825.
Sida acerifolia Zucc. in Roemer Coll. 148. 1809.

Anoda (Greek, nodeless) is a genus of tropical herbs established by the Spanish botanist Cavanilles in 1875, consisting of fifteen or more rather closely related known species, inhabiting both the Old World and the New; they have alternate stalked leaves and large, mostly purple, lilac or violet flowers, solitary and long-stalked in the leaf-axils, with a five-lobed persistent calyx, five, somewhat oblique petals, five styles and numerous stamens with filaments united into a tube; the fruit is composed of several or many radiating carpels, each containing one seed.

In the West Indian Islands, where it grows, it is frequent in fields, on banks, and often grows in cultivated grounds as a pretty and not very troublesome annual weed.

Anoda acerifolia, here illustrated, inhabits Cuba, Hispaniola, Porto Rico, Jamaica and Tobago in the West Indies, and is widely distributed in continental tropical America.

Mrs. Horne's painting was made from a plant found on the campus of the college of Agriculture and Mechanic Arts, Mayaguez, Porto Rico, in February, 1923.

The Violeta is an annual herb; its stems are ascending, prostrate or erect, smooth or a little hairy, usually with few branches. The stalked, acute or acuminate leaves are various in form and size, ranging from an inch to three inches long, sometimes halberd-shaped and entire or toothed, sometimes broader and palmately lobed, with a cordate or nearly truncate base. The slender flower-stalks are about as long as the leaves or longer; the calyx-lobes are ovate and acute. The obovate blue or lilac petals vary from one-half to two-thirds of an inch in length. The nine to fifteen carpels, radiating like short spokes of a small wheel above the enlarging and spreading calyx, are bristly-velvety, about one-sixth of an inch long, and short-beaked.

N. L. BRITTON

MENTZELIA ASPERA

(Plate 504)

MENTZELIA ASPERA

Pegadora

Native of Tropical America

Family LOASACEAE — LOASA Family

Mentzelia aspera L. Sp. Pl. 510, 1753.

Represented by only three known kinds in the West Indies, the Loasa Family, constituting the Order Loasales, consists of about two hundred and fifty species widely distributed in continental America, grouped in about twenty genera. One genus only occurs in the Old World, with one species, the African *Kissenia spathulata*.

They are herbaceous plants, many of them bearing hooked, viscid, or stinging hairs, with simple, often lobed or divided leaves, the white, yellow or red flowers often large and showy. The tube of the calyx is adnate to the ovary, its persistent limb four-lobed or five-lobed. There are four or five separate petals and many stamens with filiform filaments and introrse anthers. The ovary is one-celled, the anatropous ovules numerous. The one-celled capsular fruit is crowned by the lobes of the persistent calyx, at least when young. The genus *Mentzelia* has about thirty-five species, the one here described and illustrated being typical. The name commemorates C. Mentzel, a German botanist who died in 1701.

This species inhabits Jamaica, Cuba, Hispaniola and Porto Rico, in the northern West Indies, and the Dutch Islands Bonaire, Curaçao and Aruba, off the Venezuelan Coast, and is also recorded from St. Vincent. Its distribution in continental America extends from Mexico to Panama, Ecuador and Venezuela.

The accompanying plate represents a plant at Coamo Springs, Porto Rico, painted on January 7, 1929.

Mentzelia aspera is a straggling vine-like herb, rough-hairy all over, sometimes forming large masses with interlocking stems and branches; it may become attached to clothing, or to the hair of animals and thus freely distributed. Its slender, often much-branched stems become from three to six feet long. The lanceolate or ovate, thin and flaccid leaves are slender-stalked, from about an inch to three inches long, toothed or incised, acute or acuminate, with a narrowed truncate, or halberd-shaped base. The usually solitary flowers are about three-fourths of an inch broad. The five linear-lanceolate calyx-lobes are about one third of an inch long. The five light yellow, oval petals are somewhat longer. The stamens number about twenty. The narrowly club-shaped capsule is about an inch long.

N. L. BRITTON

EXPLANATION OF PLATE. Fig. 1.—A flowering branch. Fig. 2.—A fruit.

PLATE 505

ADDISONIA

VIOLA "APRICOT"

(Plate 505)

VIOLA "APRICOT"

Apricot Bedding Viola

Of Horticultural Origin

Family VIOLACEAE — VIOLET Family

Viola "Apricot" Hort.

Mr. Wm. Robinson, distinguished English gardener and writer on garden subjects said that all pansies should have popular English names and not Latin names, and that the name "Bedding Viola" was "a vulgar compound of bad English and Latin, whereas "Tufted Pansies" is a good English name with a clear meaning". Bedding viola is a bad name for a combination of the pansy and the tufted pansy, but is used mostly by gardeners and seedsmen to designate some self-colored perennial pansies. The common pansy or hearts' ease and the bedding viola are both derived from *Viola tricolor*, and are very much alike in many floral characters and habits, the newer type being a result of crossing the pansy with the Horned Viola, *V. cornuta*, which is perennial, hardy, and easily distinguished from all ordinary pansy types by the fact that the petals are separated, obovate, and the plant tufted, while those of the pansies are imbricated, distinctly overlapping, rounded, and the plant not tufted. So from the horned viola came the tufted, perennial habits, and from the pansy came the round, flat faces of the flowers.

Since the introduction of such varieties of bedding viola as "Apricot," big improvements have occurred in the horned viola or tufted viola group, and we now have in gardens the famous variety "Jersey Gem," everblooming, perennial, with the graceful, airy carriage, the separated petals and the tufted or spreading habit of growth.

The bedding viola is grown in any of the ways a pansy may be grown, and it may be propagated by seed, by cuttings, or by division. Sow seed in summer outdoors, transplant in autumn to beds and cover up for winter with some rough mulch, or cover the seedlings up over winter and transplant in spring, or they may be kept in cold-frames over winter. Seeds sown inside in late winter, transferred to cold-frames for hardening off, and planted out when settled

gardening weather comes, will produce bloom the first season. The soil should be a well-drained, porous one containing much organic matter, cool and moisture-holding. One tending to produce plants with strong root-growth is to be preferred.

The apricot bedding viola is a perennial herb with somewhat fusiform root, and angled, diffuse, branching stems. The leaves are ovate-cordate, deeply crenate, and the stipules nearly as large as the leaves, runcinate-pinnatifid, with prominent crenate middle lobe.

The petals are rounded, short-clawed, imbricated, distinctly overlapping. The spur is short thick, obtuse, and purple in color. The numerous seed pods are light-brown, three-celled, wide-opening, and the seeds are oblong ovoid, brown.

KENNETH R. BOYNTON.

EXPLANATION OF PLATE. Fig. 1.—Flowering part of stem. Fig. 2.—Fruit.

CLINTONIA BOREALIS

(Plate 506)

CLINTONIA BOREALIS

Clintonia

Native of Northeastern North America

Family CONVALLARIACEAE LILY-OF-THE-VALEY Family

Dracaena borealis Ait. Hort. Kew. 1: 454. 1789.
Clintonia borealis Raf. Atl. Journ. 120. 1832.

When spring spreads her garlands of green throughout the north woods, it seems as if the occasion must be celebrated by the flowers with the joyous ringing of bells. First in the procession come the bellworts (*Oakesia sessilifolia*), soon followed by the perfoliate bellworts (*Uvularia perfoliata* and *U. grandiflora*); these in turn followed by Solomon's seal (*Polygonatum*). Last in the parade, late in May comes the Clintonia, our present subject. Its broad, green, large leaves with the stout flower-stalk topped by several yellowish green flowers appearing like miniature lilies then gladden many a shady grove with their sprightly swaying grace, and while not showy, they make one think of the bells of elfland as they ring their greeting to the returning summer. When in the early fall, the mature berries take on their coat of intense and brilliant blue, a rare color indeed in nature, we see the reason of their dull-appearing flowers, for plants of northern latitudes do not put on such a display with both flowers and fruit, and so we welcome their color when it comes for it brightens the autumn woods before real fall, with its brilliant display of purple, red and yellow comes, to which the blue is a thrice welcome addition.

These plants which honor the name of De Witt Clinton, several times governor of the State of New York include that state within their area of best development and form extensive colonies throughout the shaded woodlands, especially in the evergreen forests of the Adirondack and Catskill mountains.

The plant is also easy of cultivation, asking only a partly shaded location which does not dry out in the summer heat, and where it will be undisturbed so that it may spread its wiry, creeping rootstocks into large colonies as it is a rather gregarious plant and does its best under such conditions. A colony of these plants mingled with painted trillium (*Trillium undulatum*), white trillium (*T. grandiflorum*), the bellworts mentioned above, and the rose-flowered twisted-stalk (*Streptopus roseus*) would make an attractive spot in any wild-flower garden which contains a damp, shady nook where

they will be undisturbed. Some plants of the Canada mayflower (*Unifolium canadense*) should also be added, as all of these plants usually grow together naturally.

Deep cool woods where the soil is rich and does not dry out, as well as shaded swamps are the chosen habitat of Clintonia, from Labrador south to the mountains of North Carolina and northwest to Minnesota and Manitoba.

The Clintonia is an acaulescent, perennial herb with a slender, wiry, extensively creeping rootstock, from the end of which, the year's plant rises from several successively lengthening, scarious sheaths. The leaves at flowering time number three or four, are bright green and shining, usually ciliate along the margins, becoming glabrous with age, broadly elliptic in outline, with an abruptly acute tip, varying in length from five to ten inches, and three or four inches wide at the middle, the base of the leaves tapering into sheathing bases, out of the center of which rises the flowering peduncle. The peduncle is glabrous below, sparingly pubescent above, the flowering portion and the pedicels densely pubescent. The flowers, three to ten in number, are borne at the top of the peduncle in an umbel on nodding or spreading pedicels, a secondary umbel often occurring as a lateral further down the peduncle. The perianth is yellow-green, campanulate-spreading, pubescent without, an inch to an inch and a half across; the six divisions are recurved, lance-elliptic, the basal portions channelled, and the inrolled margins simulating a claw with a hooked base, the "claw" of the outer divisions slightly longer than that of the inner. The androecium consists of six stamens, the filaments green, the lower part pubescent; the anthers yellow, extrorsely fixed. The stigma is capitate, but slightly two- or three-lobed, the stigmatic part papillose. The style is as long as the filaments. The ovary is sessile, ovoid-sub-cylindric, shallowly lobed, two- or three-celled, the ovules twenty or more. The fruit is a nearly globose, bright, deep-blue berry, the pulp white and mealy, the numerous seeds brown and shining.

EDWARD J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—A flowering peduncle. Fig. 2.—An outer perianth division. Fig. 3.—An inner perianth division. Fig. 4.—A stamen. Fig. 5.—The pistil. Fig. 6.—Peduncle in fruit. Fig. 7.—Rootstock, showing remnant of last year's plant, and the sheaths at the base of this year's plant. Fig. 8.—Sketch of entire plant.

ERYSIMUM LINIFOLIUM

(Plate 507)

ERYSIMUM LINIFOLIUM

Alpine Wallflower

Native of Spain and Portugal

Family BRASSICACEAE — MUSTARD Family

Cheiranthus linifolius Pers. Syn. Pl. 2: 201. 1806.
Erysimum linifolium J. Gay, Erysim. Nov. 31. 1842.

One of the newer rock garden and herbaceous border subjects, which appeared in flower seed catalogues here about five years ago, and has always gone under the name of Alpine Wallflower since, is this only moderately showy but sturdy and interesting biennial. Willkomm's plate of this plant shows us a rather cerise or magenta coloring of flower, but our cultivated plants throw blooms tending toward mauve, with very little hint of purple or red. From sandy fields and rocky regions of Spain, where it blooms from May to July, this was introduced. The first records show that the seeds were brought from Spain to Ireland by Mr. Clarence Elliott. They were sown at the Botanic Garden in Glasnevin, in 1913, blooming the same year. Distribution of the novelty was undertaken by Watkins and Simpson in 1919, but it had been grown in several private and public gardens for four or five years prior to that time.

Erysimum purpureum, from Palestine, is the only cultivated kind besides *linifolium*, to have flower colors other than the yellow shades, and if it were possible now to have it in gardens, it would be more popular than the now popular alpine wallflower.

In respect to the yellow group of Erysimums, most herbaceous and rock garden specialists are familiar with one or two of them. Botanists have found the Treacle-Mustard, *E. cheiranthoides*, in various districts of the United States, where it is introduced. In the New York Botanical Garden it was included for many years in the extremely varied group of annuals belonging to the Mustard Family. The American species have been in cultivation. The orange-flowered Western Wallflower, *E. asperum*, has been grown for spring rock garden bloom. Many other yellow erysimums have been grown. *E. helveticum* is a dwarf compact type, for rockeries, imitating the sunny slopes of it's mountain home. *Erysimum Perofffskianum*, from the Caucasus and Afghanistan, is an annual orange species considered by name to be the best one of all, on account of the richness of the petal color, but it is not prettier than several of the American species. *E. pulchellum*, and *E. ochroleucum* and *E.*

nanum compactum, are varieties introduced by Vilmorin from France in the past thirty years. They have all been of the yellow or orange type.

Erysimum linifolium, alpine or mauve wallflower, has been perennial in mild climates such as that of England, and may be here in some seasons, but it is rather shrubby at the base and hard to protect sufficiently, so that it is usually treated as a biennial. At the grounds of the Royal Horticultural Society in England it has proved to be a perennial.

It reaches a height of nearly two feet in the dry cliffs of parts of Portugal, and there it has large purplish blooms; but it is ordinarily more dwarf, creeping or matting, in our rock gardens, a foot high and spreading in the border or flower bed, each plant making a wiry mass a foot or more across, with three- to four-inch long stems carrying graceful clusters of mauve or lilac blooms. The flowers last from May through the summer until after the first hard freezes, and are often among the last flowers remaining in the garden. Alpine wallflowers are said to prefer the poorer soils, which must be well-drained however, and to be adapted to the less favorable parts of rockeries where they make more satisfactory flowering subjects than they do in rich border soils. Crevices of rocks, banks, and edges of borders are positions suitable for these plants.

From seeds sown in August or early autumn, seedlings may be pricked off into cold frames or pots and transplanted to the rock garden or border for first bloom in spring or later, or from late winter seed sown under glass plants may be obtained which will bloom later in the first season. Treatment accorded any biennial will secure success with this subject.

The Alpine Wallflower is a biennial or perennial plant with shrubby branching stems from many radiciform roots, the branches slender and angled. The leaves are linear-lanceolate, acute, the basal long and repand-dentate, the upper entire. The flowers are in dense corymbs or racemes, on short pedicels, with clawed mauve or lavender petals and purplish tinted sepals. The claws of the petals are exserted, the limbs obovate, and spreading. The sepals are erect, oblong, not saccate at the base. The fruits are siliques, on short stalks, in loose long racemes, and the siliques are four-sided, two-celled, each cell filled with oblong, brownish seeds.

KENNETH R. BOYNTON

EXPLANATION OF PLATE. Fig. 1.—Flowering portion of stem. Fig. 2.—Fruits.

CHEIRANTHUS ALLIONII

(Plate 508)

CHEIRANTHUS ALLIONII

Siberian Wallflower

Origin Unknown

Family BRASSICACEAE — MUSTARD Family

Cheiranthus Allionii Hort.

One of the older bedding plants of English and Continental gardens is the Wallflower, of the genus *Cheiranthus*, the wild or escaped forms of which were often found on old walls on the older countries, thus giving rise to the name of wallflower. The genus *Cheiranthus*, of Southern Europe, consists of a dozen or more perennials, usually shrubby at base, extending from Madeira and the Canary Isles eastward to the Himalayas. The Canary species is *C. mutabilis*, the violet-colored parent of one of the beautiful hybrid sorts *kewensis*, which was originated at the Royal Botanic Garden at Kew, England. This strain was first exhibited at the Royal Horticultural Society's Show by Veitch. While the favorite wallflower is a spring bloomer, this new hybrid bloomed in winter for conservatory decoration, and the plants were dwarf, compact, and exhibited colors ranging from yellow to violet, the latter shade not often found in the common wallflower. Aside from this one prominent break in wallflower history, not much had occurred in the way of hybridizing except in the way of improvement in size and flower beauty, and in the United States the wallflower was not grown to any extent, nor was it's beauty appreciated. From the native *Cheiranthus Cheiri* of the cliffs of Southern Europe, one of the most beautiful of spring bedding plants had been evolved. This choice flowering plant, from seed sown in February, furnishes the English garden with very early spring bloom the next season.

French hybridizers reported in 1913 the crossing of the wallflower *Cheiranthus Allionii* with *C. mutabilis*, to secure varieties with larger flowers than *C. Allionii* and the reddish colors from *C. mutabilis*. The Rev. Marsden-Jones in England reported crosses between *C. Allionii* and *C. alpinus*, and exhibited these before the Royal Horticultural Society in 1919. Allioni, the distinguished Italian scientist had described species of wallflowers, but this was many years before the use of these plants for crossing and for horticultural purposes. Whether this novelty is identical with the Siberian *Erysimum Marschallii*, or whether it is a hybrid as most

horticultural references say, must be determined by careful study. Certainly Allioni could have had no hand in the naming of it, unless the originator wished to honor him for his previous work in the genus.

The siberian wallflower of horticulture blooms early in the spring and for a long time thereafter. In cultivation it is really a biennial, but grows so rapidly that it may be used as an annual, and sows itself like some hardy annuals. It is one of the most valuable for blooming duration, and for the color which is one of the distinct shades in the spring garden.

Fresh seeds sown in September will produce seedlings which may be transplanted to the garden either in the fall or in the spring. These may be grown in a well-prepared seed-bed, in cold-frame, or greenhouse, and will bloom early in the spring. Seeds sown indoors in winter will produce plants for late spring blooming. From any of the early blooming stock new seeds may be sown for late summer bloom, and it has been found that considerable fall bloom results from seedlings self-sown in the garden. A longer duration of bloom is secured by cutting back the old stalks after blooming.

The Siberian Wallflower is a biennial herb, one or two feet high, with narrowly lanceolate, entire or slightly toothed leaves, two to three inches long. The brilliant orange flowers are three-fourths of an inch across, in elongated terminal racemes. The four petals have long, slender claws and spreading limbs. Two lateral sepals of the calyx are saccate, the stigma is two-lobed. The seedpods are slightly four-angled siliques, with the seeds in one row in each of the two cells.

KENNETH R. BOYNTON.

EXPLANATION OF PLATE. Fig. 1.—Flowering portion of stem. Fig. 2.—Fruit.

PUERARIA THUNBERGIANA

(Plate 509)

PUERARIA THUNBERGIANA

Kudzu-vine

Native of China and Japan

Family FABACEAE — PEA Family

Dolichos hirsutus Thunb. Trans. Linn. Soc. 2: 339. 1794.
Pachyrrhizus Thunbergianus S. & Z. Abh. Akad. Muench. 4³: 1846. 237.
Pueraria Thunbergiana Benth. Journ. Linn. Soc. 9: 122. 1867.
Pueraria hirsuta Schneid. Handb. Laubh. 2: 114. 1907. Not P. hirsuta Kurz.

Anyone having an unsightly shed or barn, or a fence or dead tree to be covered rapidly should make the acquaintance of the Kudzu-vine, as it is probably the most rapidly growing vine available, as in places where it is left undisturbed for years it trails out and up over everything in reach, covering many hundreds of feet in its wanderings, as well as completely covering trees thirty or forty feet tall under its mass of foliage which is so dense as to completely cover up the stems. The usual height to which this plant grows is from seventy feet upwards within a single season after it is well established. The writer has made measurements on horizontally growing runners which resulted in an average of eighteen inches of growth in a single night! Verily, as some would say, this must indeed be the famous "Bean-stalk" of Jack in the old nursery tale.

But, outside of its startling growth, the Kudzu has an economic value, for in China and Japan its large farinaceous roots are used as a source of an excellant quality of starch, used as food or paste; the fibre, strong and white, is used for weaving, and for ropes and nets; the cloth woven from it is known to commerce as "grass-cloth"; the twine is used to make baskets. Hay is also made from the vine, especially to feed sick horses when they refuse other food.

The plant has been introduced into the United States as a forage crop, and has yielded satisfactory results where enough space can be given it, and as it thrives well in extremely dry periods it is sometimes the only green forage available. Chemical analyses indicate a nutritious value equal to clover and alfalfa, though the leaves are considerably tougher, but horses, cows and sheep eat the green leaves readily as well as the hay. Since the Japanese plant Kudzu extensively on rough, rocky land, and hillsides too steep for tillage, using it as pasturage, trials of a similar kind in this country would be useful.

This vine thrives well in the eastern half of the United States and survives the winter as far north as Nova Scotia, although it rarely blooms much further north than New York City, and seldom matures fruits even at the latitude of Washington, D. C. Its woody stem, after becoming well established, sends out new shoots every spring, but in its younger days, north of Philadelphia and in mountain regions it is liable to be killed back even to the roots in winter, but the recovery is always rapid when spring growth starts.

The Kudzu-vine is a perennial, woody twiner, with a large, farinaceous somewhat tuberous root, often about the size of a man's arm. The cord-like stems are covered with long, tawny hairs at least for their first year, often longer. The leaves are trifoliate, on pubescent petioles seven or eight inches long. The stipules are broadly ovate, pubescent. The leaflets are stipellate, three to six inches long, the stipels nearly linear, the petiolules very densely tawny-pubescent, broad-ovate to rhombic-ovate in outline often lobed dark green, pubescent, hard-textured, the margins outlined by a hard brown vein, the apex abruptly acuminate. The flowers are borne in axillary knotted racemes up to ten inches long or more. The peduncles are much shorter than the inflorescence, pubescent. The narrowly linear bracts are early falling. The pubescent pedicels are about as long as the calyx. The calyx is subtended by two lanceolate bractlets about one fourth its length. The calyx is purplish, two-lipped, about one fourth inch long, the lobes longer than the tube, lanceolate, pubescent, the basal lobe somewhat longer and narrower than the others. The corolla is dull reddish purple, about three fourths of an inch long. The standard is clawed, nearly orbicular, the apex deeply emarginate, a bright yellow blotch outlined in dark red-purple at its base. The wings are somewhat adherent to the keel, and are much darker red-purple than either standard or keel. The keel is auricled on either side at the base. The stamens are diadelphous. The stigma is apical and very small. The style is incurved and beardless. The ovary is somewhat pubescent. The fruit is a narrow, flattened, shaggy-pubescent legume, many-seeded, seated in the persistent calyx.

EDWARD J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—Flowering portion of stem and leaf. Fig. 2.—Standard. Fig. 3.—Keel. Fig. 4.—Wing. Fig. 5.—Calyx and stamens. Fig. 6.—Pistil. Fig. 7.—Free stamen. Fig. 8.—Legume.

PONCIRUS TRIFOLIATA

(Plate 510)

PONCIRUS TRIFOLIATA

Trifoliate Orange

Native of central China

Family RUTACEAE — RUE Family

Citrus trifoliata Linn. Spec. Pl. ed. 2: 1101. 1763.
Citrus trifolia Thbg. Fl. Jap. 294. 1784.
Aegle (?) sepiaria DC. Prodr. 1: 538. 1824.
Poncirus trifoliata Raf. Sylva Tell. 143. 1838.
Pseudaegle sepiaria Miq. Ann. Mus. Ludg.-Bat. 2: 83. 1845.
Citrus triptera Carr. Rev. Hort. 15: 1869 (non Desf.).
Limonia trichocarpa Hance, Jour. Bot. 15: 258. 1882.

Orange blossoms and the sweet fragrance of oranges are always pleasing, so much so at times that one may forget that such plants might have natural ancestors some of which may still exist associated with closely related tribes. The Trifoliate Orange is closely related to the lemon and orange tribe, known to civilization since ancient times. This remarkable species is native to central China where it is found both in a wild and cultivated state. It is now cultivated in all citrus countries.

The orange was introduced into Japan in ancient times as a cultivated plant. The earliest known record of its cultivation may be found in Mannyô shû, a Japanese MSS dating from the eight century. It appears in many other ancient publications and is definitely described and figured in the Chinese work, Cheng lei pen ts'ao, printed in 1108 A.D. This interesting orange relative has thus been known to civilization for centuries, and, as may be expected, has been of some economic importance.

Since the species is fairly hardy, it has become important as a stock plant upon which delicate, choice, citrus varieties are grafted. The Chinese cultivate it with other species extensively for the skin and the vascular partitions which separate the cells in the fruit. These they dry and export for medicinal purposes under the name of Chih K'o and Chih shih, two drugs with slight laxative properties. Leaves are thrown into the hot water before bathing by the Chinese both for the fragrance and curative qualities it is thought to possess. The shrubs are used also for hedges, since their dwarf habit, fragrant flowers, evergreen branches, and strong sharp thorns make them ideal for such a use. Isolated shrubs are also used in landscaping lawns. Hybridized with *Citrus sinensis*, one of the true oranges, it forms the general group known as citranges.

It is adapted well to rich, moist, sandy, loam soils and is fairly hardy as far north as Philadelphia. A few shrubs are doing well at the New York Botanical Garden, the plants flowering and fruiting each year. It blooms in early spring before the leaf buds have opened.

The name Poncirus is derived from the french word poncir, which stands for a sort of citron.

The Trifoliate Orange is a small tree or shrub with evergreen, smooth, shiny, angular branches and stout thorns an inch or more in length. The deciduous three-foliolate leaves which develop after the flowers have opened are alternate on young twigs, but tufted on older wood, the petioles being slightly winged; the leaf is composed of three leaflets, the terminal being larger by at least a half inch compared to the two sessile laterals which are one to two inches long; in outline the leaflets are elliptic, crenulate, obtuse, emarginate, with a coriaceous texture, and dotted with pellucid oil-glands. The sweet-scented flowers are usually solitary, shortly pedicelled or sessile in the axiles of the spines. The four or five sepals are small, oblong, concave, and deciduous. The petals are also four or five in number, ovate in outline and almost clawed, slightly incurved and snow white in color. The stamens are from eight to ten, free and inserted on a thick, annular, slightly pubescent disc; the filaments are flattened below the middle, connate at the base, and reddish in color below the middle; anthers are elongated. The ovary is globose and from six to eight celled, covered by a slight pubescence. The fragrant fruit is dull lemon-colored, similar to a small orange in shape, and covered with fine downy hair; the pericarp is supplied with numerous small oil glands which are filled with a very disagreeably flavored oil; the pulp is scanty, very aromatic, but bitter to to the taste; the seeds are ovoid and so numerous that very little space is left for pulp.

G. L. WITTROCK.

EXPLANATION OF PLATE. Fig. 1.—Flowering twig. Fig. 2.—Four stamens attached to disc with its fifth sterile. Fig. 3.—Pistil. Fig. 4.—Mature fruit on branch. Fig. 5.—Seed. Fig. 6.—The trifoliate leaf attached in axil of spine.

PINGUICULA JACKII

(Plate 511)

PINGUICULA JACKII

Jack's Butterwort

Native of Cuba

Family LENTIBULARIACEAE — BLADDERWORT Family

Pinguicula Jackii Barnhart, sp. nov.

The flora of Cuba is of great interest because of its richness and its large percentage of endemism. Both of these features are exemplified by the genus *Pinguicula*.

No species of this genus was recorded from Cuba until the last month of the year 1866, when two collected and named by Charles Wright were published by Grisebach, both on the same page. They have since been found repeatedly, but always in the westernmost province of the island, Pinar del Rio, or on the neighboring Isle of Pines. It was not until the present century that two more species were discovered, this time in the mountains of the extreme eastern end of the island, in the province of Oriente, and these have never been found elsewhere. They were named and described by the writer in 1920, and again, by a strange coincidence, the two appeared on the same page. With the description of the present species, the number known to occur in Cuba is raised to five, and there is probably no other instance in which so many species of this genus are known from such a small area.

Within the past two years two species have found their way into the herbarium of the New York Botanical Garden from the province of Santa Clara, near the middle of the island, and it is possible that both may prove new. One, however, is probably merely the long-known *P. albida* of Wright, but with the white corollas sometimes showing a narrow margin of color. The other is the one here described and figured.

The type was collected by John George Jack, of the Arnold Arboretum (his no. *6794*), for whom the species is named, December 5, 1928, on the face of perpendicular rock with north exposure, at above 2500 feet altitude, at Las Lagunas, Buenos Aires, province of Santa Clara, Cuba. The description is based in part, however, and the accompanying plate drawn wholly, from fresh material from the type locality, sent by Professor Jack to the New York Botanical Garden in March, 1929; the plants then received are still living. The one illustrated, however, was much smaller, both in

length of scape and size of leaves, than the average as shown by herbarium specimens. Further collections have been made at the original station by Miss Ethel Z. Bailey, March 17, 1929, and by Professor Jack, April 25, 1930. The species seems to be a very local one.

Pinguicula Jackii is, like all species of this genus, a scapose herb with fibrous roots and a rosette of leaves; it belongs to the typical section *Pionophyllum*, with the limb of the corolla distinctly two-lipped and the well-developed tube tapering gradually into the spur. The pale, yellow-green, flat, viscid leaves, five to twelve in number, and appressed to the substratum, are cuneate-obovate, entire, and obtuse, one to two and a half inches long and an inch or two wide. The few, curved, pale green scapes are one and a quarter to six inches long; like the upper leaf-surface, they are glandular-hairy with scattered, minute, white, gland-tipped hairs. The glabrous calyx, about one seventh of an inch long, is strongly two-lipped, three of the lobes directed upward and two downward, but all five are nearly distinct from each other. The showy corolla is an inch and a half long, the tube white, veined with pale purple, the oblong rounded lobes deep blue; the two lobes of the upper lip are about three fifths of an inch long and two fifths of an inch wide and recurved-spreading; the three lobes of the lower lip are about three fifths of an inch long and half an inch wide, the sides of the middle lobe normally reflexed; the tube is flattened-obconic, twice as broad as high, white-villous within near the base of the lower lip but with no palate, and abruptly contracted into the slender obtuse or emarginate spur, which is about two fifths of an inch long. The globose capsule is at least one sixth of an inch in diameter; it may be larger when fully mature.

J. H. BARNHART.

GILIA RUBRA

(Plate 512)

GILIA RUBRA

Raven-footed Gilia

Native of the southern United States

Family POLEMONIACEAE — PHLOX Family

Polemonium rubrum L. Sp. Pl. 1: 163. 1753.
Ipomopsis elegans Michx. Fl. Bor. Am. 1: 142. 1803.
Gilia coronopifolia Pers. Syn. Pl. 1: 187. 1805.
Gilia rubra (L.) A. Heller, Bot. Expl. S. Tex. 91. 1895.

Red flowers seem to us of temperate regions to be always associated with the tropics. There are a few of these most brilliant creations of nature, however, which come into northern sections as if to glorify our floral fields and give us an idea of the gorgeous colorings to be met with in warmer climes. One of these is the Cardinal flower (*Lobelia cardinalis*) which brightens the dull air which seems to hover around swamps and bogs. Another, the subject of this sketch does not reach so far north, but where it grows through the sandy regions of the southeastern Coastal Plain makes a startling appearance when its long spikes of scarlet, all the flowers on which seem to bloom at once, appear like great torches set aflame by the midsummer sun.

It is known that humming-birds have a particular partiality to red and orange flowers, for whose long beaks these flowers have developed a long tube so that none but they and the long-tongued butterflies may be able to reach the nectar stored at its base, and it is probably on these birds and insects that the raven-footed Gilla depends for fertilization. The scarcity of humming-birds outside of tropical or warm regions may well account for the rarity of red and orange flowers in cooler climates.

This plant was once placed in the genus *Ipomopsis*, so named from the resemblance of the flowers to some species of *Ipomoea* and particularly to the Cypress-vine (*Quamoclit pennata*) which was then included in the genus *Ipomoea*, and one of its common names, standing-cypress, reminds one of the resemblance. *Ipomopsis* is now, however, included in the genus *Gilia*.

The name raven-footed Gilia comes from the supposed resemblance of the leaves to the raven's foot.

The name *Gilia* was made to honor Felipe Gil, a Spanish botanist.

The plant is not extremely difficult to cultivate, providing that its preference of sandy soil is remembered in the planting, as also

its liking for open sunny places. Since it is a biennial, seed must be looked forward to as the means of propagation. With the preceding precautions taken, this should be a handsome and welcome addition to the garden.

Its natural range is from North Carolina to Florida and west to Oklahoma and Texas. Throughout the Coastal Plain and the neighboring Piedmont it grows in open fields and along the margins of woods, exhibiting a marked preference for sandy soil. It has been found as an adventive in Ohio, in Franklin Co., Mass., and in Cumberland Co., N. J.

The raven-footed Gilia is a biennial herb, the stems simple below the inflorescence, usually solitary, two to six feet tall, softly pubescent, especially above. The leaves are alternate, bright, light green, very numerous and sessile; the blades pectinately cut to the midrib, the segments narrowly linear to filiform. The inflorescence is a thyrsoid panicle. The flowers are an inch to an inch and a half long, and are borne very thickly along the inflorescence, on short pedicels. The calyx is one-fourth to three-eighths of an inch long, campanulate, the lobes lanceolate, and acute, about the same length as the tube; the whole enlarging in fruit to about one half inch long. The corolla is trumpet-shaped, the tube fully an inch long; the limb from one fourth to one half inch long, the divisions acutish; the tube and outside of the limb is a bright, rosy scarlet, the limb within is scarlet, streaked and flecked with yellow, the tube salmon-red. The androecium consists of five stamens adnate to the upper end of the corolla tube and alternate with the divisions of the limb. The filaments are red, the anthers yellow. The gynoecium is of a single carpel, the ovary three-celled, with a thick axis. The styles are united and red, as are also the three stigmas. The fruit is a three-celled loculicidal capsule, from one-fourth to one-half inch long, oval, in maturity distending and often rupturing the surrounding calyx. The seeds are straw-colored, several in each cell of the capsule.

EDWARD J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—The flowering top of the stem. Fig. 2.—A section of the corolla, showing the inside markings and the attachment of a stamen. Fig. 3.—A ripe capsule.

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